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SEVENTEENTH REPORT

12,079

OF THE

Commissioners of Fisheries

OF THE

STATE OF NEW YORK.

TRANSMITTED TO THE LEGISLATURE JANUARY 10, 1889.

ALBANY:
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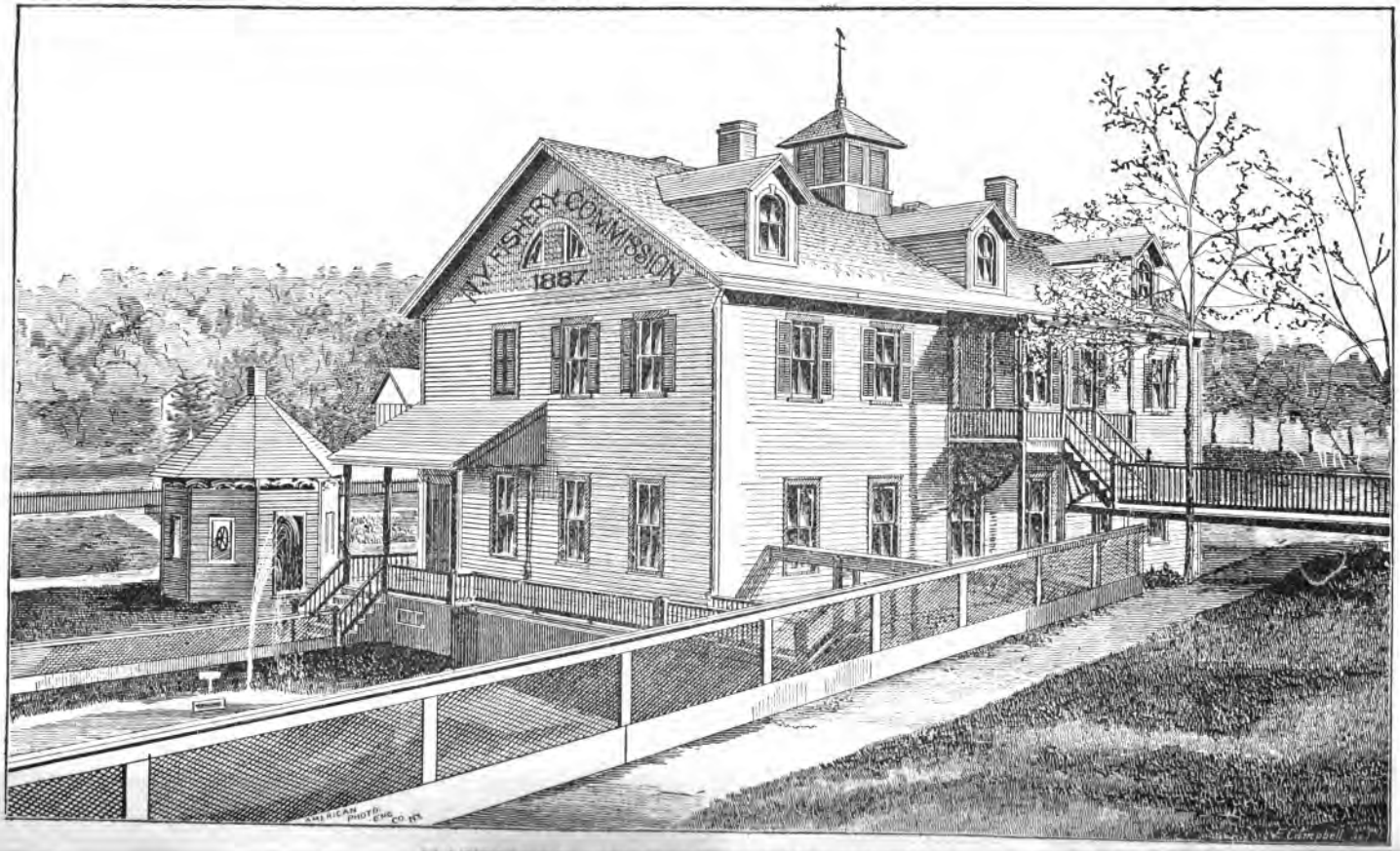

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STATE OF NEW YORK.

No. 29.

IN ASSEMBLY,

JANUARY 10, 1889.

SEVENTEENTH REPORT

OF THE

COMMISSIONERS OF FISHERIES.

NEW YORK, *December* 15, 1888.

To the Speaker of the Assembly:

SIR.— I have the honor to transmit herewith in compliance with law, the Annual Report of the Commissioners of Fisheries for the year 1888, by order of the commissioners.

EDWARD P. DOYLE,

Clerk and Acting Secretary.

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REPORT.

The Commissioners of Fisheries herewith present, in compliance with law, a report of their official operations for the year beginning December 1, 1887, and ending November 30, 1888.

The report embodies the operations, given at length and in detail, at the several fish hatcheries, the work of the shell-fish department and the reports of the State oyster protector and the chief game and fish protector of the State.

The work at the hatcheries for the past year has been vigorously prosecuted and has produced excellent results. The completion of the new hatcheries at Cold Spring Harbor and at Mill Creek has given the commission greater facilities for the successful propagation of fish fry, and the best possible use has been made of these additional opportunities.

The new hatchery at Mill Creek, finished during the summer of this year, was built under the personal supervision of Commissioner Sherman, and is admirably adapted for the work for which it was designed.

The hatchery at Cold Spring Harbor, though erected during 1887, was not fully equipped and furnished until this summer. Its efficient superintendent, Mr. Mather, in fitting out the hatchery for active work, secured the latest and most improved apparatus, and the hatching-room at Cold Spring Harbor is a model of its kind.

The commissioners have now five fully equipped hatcheries, two of them entirely new, and the possibilities for the artificial propagation of fish on the largest scale are very great.

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It will be the policy of the commission, while not abandoning the propagation of trout, to concentrate its efforts upon the production of food fishes, the stocking of the great lakes with whitefish, the hatching of shad in the Hudson, and the planting of salmon trout and muskallonge throughout the interior of the State.

In this way the work of the commission can be made of the utmost practical benefit to the public generally, and repay a thousandfold the appropriations made for its support.

The increasing number of shad caught yearly in the Hudson, the rapidly growing evidences of the presence of salmon in the same stream, and the comparative abundance of trout in the Adirondacks, are sufficient proof of the value of the work of the commission in the past, and the future will show still greater results.

The table appended hereto, showing the catch of shad in the Hudson during the past season, illustrates this; while in the Connecticut river the catch decreases yearly, the catch in the Hudson grows with every season. Matthew Kennedy, who has collected the statistics of the catch from the Hudson for several years for the commission, and who obtains the actual figures from the fishermen, says in his report: "I found on observation and by general information from the fishermen, that this has been the most successful season in twenty years, as to the grade or size, quality or quantity; also, at close of season, a larger run from hauls or drifts made were noticeable at all points visited by me." He also says: "It has proven a remarkably prosperous and successful season for all engaged in shad fishing."

TABLE OF CATCH OF SHAD FROM THE HUDSON RIVER.

On the upper Hudson, from Fishkill to Albany	504,751
On the lower Hudson, from Fishkill to Yonkers.....	308,453
Shad from the Hudson river, received in the markets of the city of New York from the Hudson river below Yonkers and from New York bay	695,344
Total	**1,508,548**

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During the past year the department of fish culture has been thoroughly reorganized and a comprehensive system of rules adopted for its practical management on business principles. The hatcheries will each be under the control of a commissioner in charge, to whom the superintendent will be responsible, as the commissioner will be in turn responsible to the full board. The commissioner in charge will investigate the expenditures of each hatchery, to the end that they may be made with a proper reference to economy, see that its work is prosecuted to its fullest capacity, and supervise generally its entire operations.

This, it is believed, will produce the best results with the least possible outlay of money.

At intervals, also, meetings will be held at the various hatcheries, that the commissioners may all be cognizant of the manner in which the work is conducted. Tables showing the yearly production of fish-fry and their distribution will be found in the appendix.

They are very interesting, and show a large increase over preceding years. This is most satisfactory to the commission, and is very creditable to the various superintendents of the hatcheries. Millions of fish have been successfully propagated and planted in the public waters of the State. This work is most important and valuable, and, without doubt, has been all that has prevented the depletion and final exhaustion of the State fish supply.

The correspondence of the commission with prominent sportsmen and fishermen throughout the State shows this fact clearly. Letters are filled with evidences of gratitude for the work of the commission, and with statements showing the increase of fish, especially trout, in the rivers and lakes.

The report will be found especially interesting, in that it contains, outside of the ordinary details of fish propagation, a description of the shad-hatching in the Hudson river, the investigations of Fred Mather as to salmon in the head-waters of the same stream, and the correspondence and papers relative to the successful experiment of hatching muskallonge in Chautauqua lake.

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In its department of fish culture, the commission sustained a severe loss during the past year by the death of Mr. Seth Green, superintendent of the State hatchery at Caledonia. Mr. Green was one of the best known and most successful fish culturists in the world. Appointed as commissioner with Mr. Seymour and Mr. Roosevelt, in 1868, he resigned to become superintendent of the State hatchery at Caledonia, and served continuously in that position until his death. Mr. Green was essentially a practical fish culturist, and possessing energy and marked executive ability, he rendered the commission and the State invaluable service. His brother, Monroe A. Green, who had been his assistant for a number of years, was appointed to succeed him.

Mr. Edward F. Boehm, one of the experienced practical culturists at Caledonia, was appointed as superintendent in charge of the new hatchery at Mill Creek. He will, it is believed, prove thoroughly efficient and trustworthy.

The commissioners desire at this time to express their sincere thanks for the very valuable assistance rendered the State by the United States Fish Commission at Washington. Not only has the State been furnished, free of charge, with millions of eggs and fry, but the work of hatching and distribution has in many instances been done without charge to the State. The commissioners warmly appreciate the kindness and courtesy of the several commissioners, Professors Baird and Goode, and the present Commissioner, Col. McDonald, that prompted the aid given the commission and the State, and take this opportunity to express their gratitude and sense of obligation.

The work of the shell fish department is found in the reports of the engineer and clerk. They are given at length, and that of the engineer describing the operations of his department during the summer and early fall in Long Island Sound and Raritan Bay is especially interesting. He has divided the entire area of Long Island Sound into townships, subdivided into sections and lots, and presents a table giving the exact position by latitude and

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longitude of the corners of each township. This work was very elaborate and is wonderfully accurate, only an accumulated error of one meter being found in calculations covering ninety miles. The work of the engineer's department has been thoroughly done and is very creditable. The available lands under the waters of the State are rapidly being taken up and cultivated. Nearly five hundred applications for franchises have been already received, and they are coming in every day, and although the majority are for plots of small acreage, many are for the full limit of 250 acres.

A large number of the applications are for new or unoccpied land. The security of tenure afforded by chapter 584, Laws of 1887, known as the Oyster Franchise Law, bids fair to make this State one of the greatest oyster-producing States on this continent. Already it is estimated that ten times the amount of land is being cultivated that was occupied ten years ago, and the rapidly increasing demand warrants the belief that the growth of the business will be even greater during the next ten years. In fact, there can be no doubt that the depletion and exhaustion of the great natural oyster beds of Chesapeake Bay will ultimately compel the artificial cultivation of every available acre of land under water in New York State. The clerk's report shows simply the routine work of the commission in granting franchises and the amount received from their sales.

One hundred and fifty-three franchises have been granted, and $2,039 have been received and paid into the State treasury.

The difficulty in surveying each lot and the amount of time necessary have prevented the full realization of the expectations of the commission as to the income from these franchises, but enough has been received already to show the profitable nature of this work to the State.

The engineer has now a large number of applications almost ready for granting, and the receipts next year must necessarily be much larger than during any preceding

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year. From this it is expected the State will derive much more than enough to pay the expense incurred hitherto, without taking into consideration the immense benefit generally to the people of the State through the protection and encouragement of this important industry.

With these reports will be found the report of the State oyster protector to the shell fish commissioner. His report is most gratifying, and shows that there has been a marked improvement in the condition of the waters in the vicinity of the bay and harbor of New York. He says that the universal testimony of oystermen and boatmen is to the effect that the condition of the waters in the vicinity of the oyster territory is much better than heretofore. It is especially gratifying that this state of affairs has been brought about mainly through the efforts of those who were the original offenders against the law. They have united recently in showing a commendable desire to observe the law themselves and to prevent others from violating it. Some of them, however, are still incorrigible, and a number of indictments are still pending. It appears that through an omission in the Code, corporations can not be compelled to appear in court and plead to an indictment, and the protector complains that while he can secure indictments, it is almost impossible to obtain a conviction. An act to effect the desired amendment to the Code passed the Legislature last winter, but failed to receive the Governor's signature through some oversight, no one appearing before him in favor of the bill. It is hoped that the omission will be remedied by the next Legislature. Mr. Mesereau has done valuable work, and the jurisdiction of his department should be extended. He should be given an increased appropriation, with sufficient assistance to enable him to patrol thoroughly the entire oyster territory of the State.

Maryland spends $60,000 each year on her oyster police, while the New York oyster planter has no protection save what can be obtained at his own expense through private watchmen. With an appropriation large enough to pro-

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cure two or three additional men and a small steamer, the effectiveness of Mr. Mesereau's work could be very largely increased.

With the limited means at his command he has done remarkably well, and should be sustained by the Legislature.

Acting upon the recommendations of the commission, the last Legislature passed an act conferring upon the commissioners absolute jurisdiction, with power of appointment and removal over the fish and game protectors of the State, and provided for the appointment of a chief game and fish protector.

Since the organization of the force, the power of appointment and removal is vested in the Governor, although the protectors are under the supervision and control of the commissioners.

It was clearly evident from the start, that the power of removal should be in the same body, the Governor having but little knowledge of the merit or work of a protector.

The commissioners met immediately after the passage of the law and appointed the fifteen protectors provided for, retaining the efficient members of the old force, and shortly after designated Mr. Frederick P. Drew as chief protector. Mr. Drew, who has had many years experience under the old law, was very highly recommended to the commission, and was appointed only after a thorough and complete investigation as to his worthiness and fitness for the place. He has divided the State into districts, and is rapidly effecting a thorough organization of his force.

The work of his department shows already the improvement anticipated by the commissioners, and proves the wisdom of their recommendations.

At a meeting of the commissioners, held in New York, December twelfth, a resolution was passed authorizing the president of the commission to confer with the commissions of the several States adjoining New York, including the Dominion of Canada, with a view to secure their coöperation in fish and game protection.

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As far as possible, it is desired that the fish and game laws of the several States should be to the same effect; that what is unlawful on one side of a stream forming a boundary line, should also be unlawful on the other side. It is absolutely necessary, for instance, in order to thoroughly protect the shad or salmon in the Hudson river, that the same measures be enforced by New Jersey, as well as New York. If the president is successful in his negotiations, much will have been done toward thorough and efficient protection.

At this point the commissioners desire to again suggest the necessity of some commission, appointed from or outside the Legislature, to codify the game and fish laws of the State, and make them clear and definite, as no proper and systematic game protection is possible while the present mass of vague, conflicting and contradictory statutes remain in force. The law should be clear and direct, and free from reservations and exceptions, so that there can be but one construction placed upon its meaning. As the law stands at present, conviction is almost impossible, and an offender needs but a skillful lawyer to escape punishment.

In the way of new legislation, the commissioners would recommend the restoration of the law for the protection of lobsters. This is important and necessary, and an immense amount of harm has been done since its repeal in 1887. Lobsters are already becoming extremely scarce, and although much is being now done by the commission toward their artificial propagation, laws are needed for their protection. The exemption clause in the Shad Restriction Law, as to Westchester county, should also be taken out. To allow the citizens of Westchester county to use their nets on Sunday practically shuts up the entire river. Shad must be allowed one day to pass up to their spawning grounds. The commissioners recommend, also, a general fishway law similar to those in force in Maine and Illinois. Such an act would leave the building of fishways discretionary with the commission. As it is now,

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fishways are built wherever there is a constituency sufficiently interested to influence a member of the Legislature to introduce and pass a bill. Frequently they are of no practical use when completed, because of the obstructions in the stream above and below them, and again it happens that the appropriation lapses before the Superintendent of Public Works has time to attend to the matter. The fishways should be built systematically by the direction of the commission and by the advice of its experts. Were the proper number of fishways built in the Hudson river, the question whether that stream was, or was not, a salmon river, would, we believe, in a short time be definitely settled.

The law regarding salmon should also be amended, so as to prohibit the catching of salmon under three pounds in weight. Yearling fish have this season been caught in large quantities in the head-waters of the Hudson.

The commissioners recommend that the laws regarding the stealing of oysters and the disturbance of oyster-beds, be made more stringent, and that some system be devised for the registration and licensing of oyster boats.

The commissioners estimate the amount necessary for the work of the commission for the ensuing year: For the fish commission proper, $35,000; for the engineer's department, $5,500; for the salary of the clerk and incidental expenses of the office, $4,000.

This has been an exceedingly busy year for the commissioners, as the record of the minutes of the meetings will show. There have been in all during the year, eighteen meetings, of which twelve were regular and six special. In the summer, the president of the commission, Hon. Robert B. Roosevelt, was appointed Minister to Holland. He immediately resigned his position as Commissioner of Fisheries, and Mr. Henry Burden, of Troy, who had been interested in the work of the commission for many years, was appointed in his stead. Mr. Roosevelt was an ardent sportsman, a scientific fish culturist, and a gentleman of ability and wide experience. He was one of the original

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commissioners appointed in 1868, and during the course of his long term of office, rendered great service to the commission and the State. His resignation was much regretted by his colleagues. Eugene G. Blackford, who, since 1879, has given a large part of his time and attention to the work of the commission, was unanimously chosen to succeed Mr. Roosevelt as president.

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APPENDIX.

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REPORT OF MONROE A. GREEN.

To the Board of Commissioners of Fisheries:

GENTLEMEN.— I herewith transmit an annual report of the hatching, distribution of fish, and the expenses in conducting the Caledonia hatchery for the year commencing December 1, 1887.

The Caledonia hatchery was under the supervision of Seth Green, as superintendent, from December 1, 1887, to the time of his decease, which occurred in September, 1888. Since that date until the present time it has been conducted by the undersigned. During the past year the purchase of a parcel of land lying in front of the hatchery, together with an island, and about four acres of land situate west of the hatchery, making in all about fifteen acres of land, has been consummated, and the title to said land is now in the State of New York. The deeds, maps and evidences of title have been deposited with the Comptroller of the State. This purchase gives the State full control of all the water in Spring creek, and gives abundant room for the construction of any additional ponds that may be deemed necessary in the future. It also gives a roadway to the hatchery and ponds. A good, substantial roadway, leading from the highway to the grounds and hatching-house, has been constructed on the south side of the ground purchased. The roadway formerly used, running between the ponds, will be discontinued. This will be a great improvement, and make the grounds much more attractive. The small hot-house in which plants have been kept during the winter can be moved at small expense, thus making the ponds and grounds far more attractive to the multitude of visitors who annually visit there.

A house of such size as the commissioners may recommend should be constructed. It should be erected north of the roadway. The great number of ladies and picnic excursions who visit the grounds yearly render it very desirable that such house should be sufficiently large to give them a public room and other conveniences. No hotel is nearer than Caledonia or Mumford, each place being about three-quarters of a mile distant.

The appended tables show the number of fish hatcheries and the distribution of them.

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It has been deemed advisable to dispose of about one-half of the salmon trout kept in ponds, as the expense of feeding was thereby greatly reduced.

The ponds of the Caledonia hatchery are well filled with brook trout, brown trout and California trout, and will furnish all the spawn that can be used at the hatchery, and can furnish other hatcheries in case it shall become necessary.

The commissioners have desired that whitefish should be hatched during the winter at Caledonia. In pursuance of this direction I have obtained a number of glass jars, and shall obtain from Detroit about two million whitefish spawn, and shall hatch them. The water of Spring creek is warmer during the winter months than the water of the lakes, the natural spawning beds of the whitefish. The result is that the eggs hatch about one month earlier than they would in lake water, and rather too early for distribution in the lakes.

Shad hatching in the Hudson river has been conducted as in years past. The great difficulty is in obtaining ripe fish, as they are compelled to run the gauntlet of the lower part of the river, constantly filled with nets, to reach the points where they can be obtained in condition to obtain spurion and milt. There was hatched during the season of 1888, and turned into the river, under the supervision of Jonathan Mason, 3,924,500 young shad.

This season the catch of shad in the river has been large.

A comparison between the Hudson, which has been stocked annually, and the Connecticut, in which no hatching has been done for some years past, shows the necessity of carefully stocking this river, and that no pains should be spared in enforcing laws necessary to properly carry on the work.

The report of Chester A. Green, upon hatching muskallonge, is herewith submitted.

We have obtained from the upper lakes 2,300,000 salmon trout eggs, and shall be able to fill all orders and undoubtedly have a large number to place in such lakes within the State as the commissioners may select.

Many of the small lakes in the western part of the State are now well stocked with salmon trout, and many have been taken during the past summer by parties who visit the lakes for pleasure, and afford a much better fish for the table than those taken from the great lakes, as the water of our small lakes is better. and the food obtained in them of better quality.

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BLACK BASS.

It has been found, by actual practice and experiment, that the best and cheapest way to obtain, when black bass are wanted, is to purchase them of the fishermen near the foot of Lake Ontario.

They can be purchased for from two to five cents each, and will weigh from one-quarter to one-half pound each. They can be kept alive in cars built for that purpose, until wanted for shipment, and distributed from Cape Vincent, or other points, as cheaply as from any other point. They can be obtained in quantities sufficient to supply all orders.

I desire to recommend the black bass as the best fish for stocking all lakes, rivers and waters suitable for it. They breed rapidly, protect their young until able to take care of themselves, are a game fish, and afford to most anglers more actual sport than any other fish. As a fish for the table they have few superiors. They will make themselves abundant in any suitable water, and need nothing but protection from poachers in spawning season.

All lakes and rivers suitable for black bass should be as speedily stocked as possible.

CARP.

The carp ponds are well filled with fish suitable for distribution in the spring, and we can furnish to parties, who may want them, any reasonable number. There is at least now ten thousand that should be distributed as soon as convenient.

We have filled all orders during the past year, and shall be glad to dispose of all suitable for ponds.

MONROE A. GREEN,
Superintendent Caledonia Hatchery.

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REPORT OF DISTRIBUTION OF FISH FOR 1888—UNDER DIRECTION OF SETH GREEN, SUPERINTENDENT.

DISTRIBUTION OF SALMON TROUT FRY FROM CALEDONIA HATCHERY, 1888.

Date.	Number of fish.	WATERS IN WHICH DEPOSITED.	County.	By whom ordered.	P. O. address.	By whom delivered.
Mar. 5	50,000	Blue Mountain lake, Eagle and Raquette	Hamilton	W. W. Durant	New York	E. F. Boehm.
Mar. 14	100,000	Hemlock	Livingston	N. A. Kellogg	Springwater	Jonathan Mason.
Mar. 19	50,000	Green pond	Lewis	L. C. Loke	Harrisville, N. Y.	F. A. Green.
Mar. 20	50,000	White	Oneida	R. U. Sherman	N. Hartford, N. Y.	Frank Redband.
Mar. 20	25,000	Woodhull	Herkimer	L. S. Hunt	Utica, N. Y	Frank Redband.
Mar. 22	75,000	Canandaigua	Ontario	C. B. Lapham	Canandaigua, N. Y.	F. A. Green.
Mar. 22	80,000	Lake George	Warren	R. S. Coleman	Sandy Hill, N. Y	R. S. Coleman.
Mar. 22	80,000	Lake George	Warren	R. L. Banks	Albany, N. Y	J. Mason.
Mar. 23	112,000	Owasco	Cayuga	J. A. Clary	Auburn, N. Y	F. A. Green.
Mar. 26	100,000	Lake George	Warren	R. L. Banks	Albany, N. Y	Jonathan Mason.
Mar. 29	100,000	Cayuga	Tompkins	F. H. King	Ithaca, N. Y	E. F. Boehm.
Mar. 29	80,000	Lake George	Warren	R. S. Coleman	Sandy Hill, N. Y	J. Mason.
Mar. 29	80,000	Lake George	Warren	R. L. Banks	Albany, N. Y	J. Mason.
April 3	100,000	Canandaigua	Ontario	C. B. Lapham	Canandaigua, N. Y.	Am Express Co.
April 4	85,000	Lake George	Warren	R. L. Banks	Albany, N. Y.	B. F. Shoddock.
April 4	85,000	Lake George	Warren	R. S. Coleman	Sandy Hill, N. Y	R. S. Coleman.
April 9	12,000	Sand lake	Broome	S. C. Millard	Binghamton, N. Y.	F. A. Green.
Total..	1,264,000					

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DISTRIBUTION OF BROOK TROUT FRY FROM CALEDONIA HATCHERY, 1888.

Date.	Number of fish.	WATERS IN WHICH DEPOSITED.	County.	By whom ordered.	Post-office address.	By whom delivered.
Feb. 8	10,000	Spring creek	Suffolk	J. B. L. Mott	New York	M. A. Green.
Feb. 16	10,000	Trout brook	Oswego	G. A. Davis	Mexico, N. Y	M. Collins.
Feb. 16	15,000	Head-waters Esopus creek	Ulster	Mrs. W. H. Moak	Brooklyn, N. Y.	J. Mason.
Feb. 23	18,000	Cherry, Clear and West branch Conewangas creeks	Chautauqua.	W. E. Becker	Cherry Creek, N. Y.	P. Buloit.
Feb. 24	4,000	Hills and Gulf brooks	Cayuga	J. R. Page	Sennett, N. Y.	American Express.
Feb. 28	5,000	White creek	Livingston	A. J. Tripp	Avon, N. Y.	A. J. Tripp.
Feb. 29	18,000	Factory brook, headwaters Tioughnioga and Haights gulf stream	Cortland	C. H. Stevens	Homer, N. Y.	C. H. Stevens.
Mar. 1	25,000	Kisco river, Locust, Odell and Harris brooks	Westchester.	Jos. Wood	Mt. Kisco, N. Y.	J. Mason.
Mar. 5	1,000	Woods creek	Monroe	Thos. E. Wood	Chili Centre, N. Y.	Thos. E. Wood.
Mar. 5	20,000	Bear Pond brook	Hamilton	W. W. Durant	New York	E. F. Boehm.
Mar. 8	20,000	Quaker Basin stream, Godfrey brook, Beaver Meadow creek and Sam Carpenter's stream.	Madison	W. E. Burdick	De Ruyter, N. Y.	W. E. Burdick.
Mar. 9	15,000	Carpenter's creek	Onondaga	R. W. Jones	Syracuse, N. Y.	M. A. Green.
Mar. 9	15,000	Head-waters Onondaga creek	Onondaga	E. G. Seymour	Syracuse, N. Y.	M. A. Green.
Mar. 15	10,000	Thomas creek	Broome	S. C. Millard	Binghamton, N. Y.	E. F. Boehm.
Mar. 16	15,000	Cold, Crooked and Dayton brooks	Chautauqua.	F. H. Sylvester	Sinclairsville, N. Y.	J. Mason.
Mar. 16	10,000	Fish and Pintrock creeks	Lewis	A. Katsmeyer	W. Leyden, N. Y	A. Katsmeyer.
Mar. 19	16,000	Beaver river and tributaries	Lewis	Chas. Felton	No. 4, New York	E. F. Boehm.
Mar. 19	12,000	Roberts' pond	Oneida	F. J. Spriggs	Utica, N. Y	E. F. Boehm.
Mar. 20	10,000	West branch Unadilla river and tributaries	Oneida	F. A. Holmes	Babcock Hill, N. Y.	H. Robinson.
Mar. 20	12,500	Woodhull lake	Herkimer	L. S. Hunt	Utica, N. Y	F. Redband.
Mar. 22	16,000	Gillet creek and tributary	Herkimer	M. J. Burrell	Little Falls, N. Y.	Otis Olds.
Mar. 22	12,000	White, Manly and Hinds brooks, tributaries to West Canada creek	Herkimer	H. K. Brown	Newport, N. Y.	Otis Olds.
Mar. 26	25,000	Neil's creek and tributaries to Cohocton river.	Steuben	W. A. Sager	Wallace, N. Y	F. A. Green.
Mar. 26	20,000	Owego creek and tributaries	Tioga	W. L. Hoskins	Owego, N. Y.	F. A. Green.
Mar. 26	8,000	Libby and Andrews brooks	Onondaga	D. D. Candee	Syracuse, N. Y.	E. F. Boehm.
Mar. 26	10,000	Tributaries to Onondaga creek	Onondaga	Henry Loftie	Syracuse, N. Y	E. F. Boehm.
Mar. 27	6,000	Bishop, Putnam, Snooks, Edwards, Flattery and Enomynous brooks	Onondaga	L. Herber, Sr.	Fayetteville, N. Y.	E. F. Boehm.
Mar. 27	16,000	West branch of West branch of Chenango river and tributaries	Madison	J. W. Clark	Buffalo, N. Y	E. F. Boehm.
Mar. 27	15,000	Handsome and Buell brooks and tributaries to Chenango river	Chenango	C. L. Easton	Sherburne, N. Y.	E. F. Boehm.
Mar. 27	12,000	White and Shingle Hollow creeks	Rensselaer	J. Marshall	Hoosick Falls, N. Y.	John Marshall.
Mar. 28	12,000	Headwaters Deer river	Lewis	C. Neibergal	Montague, N. Y.	G. W. Vanderwalker.
Mar. 29	15,000	Lasher, Maloney, McVean lakes, Lefler, Parsons, Shulto, McEwan, Skinner and Marble brooks	Fulton	H. Springer	Gloversville, N. Y.	F. A. Green.

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DISTRIBUTION OF BROOK TROUT FRY—(*Continued*).

Date.	Number of fish.	WATERS IN WHICH DEPOSITED.	County.	By whom ordered.	Post-office address.	By whom delivered.
Mar. 29	15,000	Veghte, Lothage, Empie, Gage, Cork, Plank and Drury brooks	Fulton	George Yost	Johnstown, N. Y	F. A. Green.
April 3	15,000	Sawmill, Peekskill and Canopis brooks	Westchester.	B. R. Kittridge	New York	F. A. Green.
April 4	12,500	Cold Spring, Spaulding's and Wells creeks	Steuben	Z. L. Parker	Bath, N. Y.	E. F. Boehm.
April 4	6,000	North Cohocton creek	Steuben	Z. L. Parker	Bath, N. Y.	E. F. Boehm.
April 4	3,000	Cohocton creek	Steuben	D. W. Lyon	Cohocton, N. Y	E. F. Boehm.
April 5	12,500	Mud lake, Charley lake, Dunning, Mill and Jimney creeks	Hamilton	W. W. Burnham	Wells, N. Y	E. F. Boehm.
April 6	15,000	Peeks, Steel, Mill, Elk, Glenberry and Bagley brooks	Delaware	F. H. Griffis	Delhi, N. Y	F. H. Griffis.
April 9	15,000	Wiston, Wheeler, Crandall and Christie brooks,	Chenango	H. F. Whittenhall	Greene, N. Y	F. A. Green.
April 9	15,000	Otsego creek and tributaries	Otsego	C. M. Lewis	Oneonta, N. Y	F. A. Green.
April 10	10,000	Loxkill creek	Dutchess	H. L. Cookingham	Red Hook, N. Y	C. B. Hoffman.
April 10	25,000	Rossman, Link, Harlemville, Grayville and Groate brooks	Columbia	H. A. Feroe	Hudson, N. Y	F. A. Green.
April 11	12,500	Coddington, Kenyon Falls and Little Beaverkill	Sullivan	A. W. Smith	Parksville, N. Y	A. W. Smith.
April 13	12,500	Mud river, Fish and Cobb's creeks	Oneida	H. W. Leonard	Camden, N. Y	F. A. Green.
April 13	12,500	Tributaries to Chenango creek	Madison	E. C. Bass, M. D	Cazenovia, N. Y	F. A. Green.
April 13	10,000	Toby, Griswold and Baker brooks	Delaware	R. McKinnon	Masonville, N. Y	A. Gardner.
April 16	5,000	Spring creek	Genesee	Lathrop Bros.	Darien Center, N. Y.	Lathrop Bros.
April 16	20,000	East branch Unadilla river	Herkimer	H. H. Wheeler	West Winfield, N. Y.	F. A. Green.
April 16	16,000	Alder creek and tributaries	Oneida	J. D. Kernan	New York	F. A. Green.
April 17	12,000	Beaverkill and tributaries	Sullivan	G. H. Hawkins	Rockland, N. Y	G. H. Hawkins.
April 17	12,000	Tributaries to Willowemoc and Beaverkill	Sullivan	W. E. Sprague	Roscoe, N. Y	G. F. Taylor.
April 17	20,000	Tremperskill and tributaries	Delaware	Joseph Ballentine	Andes, N. Y	W. K. Miller.
April 17	1,000	Spring creek tributary to Block creek	Monroe	George H. Smith	Rochester, N. Y	George H. Smith.
April 18	12,000	Tributaries to Charlotte creek	Delaware	J. Davenport	Davenport, N. Y	J. Davenport.
April 19	10,000	Tributaries to Neversink river	Sullivan	N. F. Hodge	Neversink, N. Y	G. F. Walker.
April 19	10,000	Larnes, Benson, Broome and Trovis brooks	Sullivan	Ira Martin	Neversink, N. Y	G. F. Walker.
April 19	10,000	Eastern branch Neversink river	Sullivan	N. W. Dean	Neversink, N. Y	G. F. Walker.
April 19	15,000	Chamber Hollow and Mallory's brooks	Delaware	T. C. Bronk	Hamden, N. Y	J. A. Crawford.
April 19	10,000	Esopus creek	Ulster	C. F. Conant	St. Remy, N. Y	C. F. Conant.
April 26	8,000	Venrooyskill creek	Ulster	George Young	Kingston, N. Y	F. A. Green.
April 27	2,000	Allen's creek	Monroe	W. S. Little	Rochester, N. Y	W. S. Little.
April 28	3,000	Caledonia Spring creek	Livingston	Seth Green	Rochester, N. Y	F. Redband.
May 2	20,000	Kiskaton and Shinglekill creek and tributaries,	Greene	Miss J. Hopkins	Catskill, N. Y	F. A. Green.
May 2	14,000	Plattekill and tributaries	Ulster	Thos. B. Keeney	Saugerties, N. Y	F. A. Green.
May 2	20,000	Head-waters Esopus creek	Ulster	A. B. Parker	Kingston, N. Y	E. F. Boehm.
May 9	20,000	Amenia creek and Spring brooks	Dutchess	W. H. Bartlett	Amenia, N. Y	F. A. Green.
May 9	6,000	Katonah creek	Westchester.	A. G. Case	New York	F. A. Green.
May 15	18,000	Fall, Six-Mile and Willow creeks	Tompkins	F. H. King	Ithaca, N. Y	B. F. Shoddock.

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May 17	15,000	Battenkill, Block, White Beaver, Warford and Dry creeks	Washington.	J. M. Williams	Salem, N. Y.	J. McNaughton.
May 19	6,000	Tributary to Willowemoe river	Sullivan	G. R. Benson	New York	F. A. Green.
May 19	8,000	Caledonia creek	Livingston	Seth Green	Rochester, N. Y.	B. F. Shoddock.
May 30	12,000	Fish creek	Oneida	Jno. Hyland	Dansville, N. Y.	F. A. Green.
May 30	7,000	Caledonia creek	Livingston	Seth Green	Rochester, N. Y.	B. F. Shoddock.
May 31	4,000	Caledonia creek	Monroe	Seth Green	Rochester, N. Y.	B. F. Shoddock.
June 18	6,000	Caledonia creek	Monroe	Seth Green	Rochester, N. Y.	E. F. Boehm.
Total..	941,000					

Distribution of European Brown Trout, Caledonia Hatchery, 1888.

Mar. 5	5,000	Bear Pond brook and tributaries	Hamilton	W. W. Durant	New York	E. F. Boehm.
Mar. 9	3,000	Carpenter's creek	Onondaga	R. W. Jones	Syracuse, N. Y.	M. A. Green.
Mar. 15	2,000	Thomas creek	Broome	S. C. Millard	Binghamton, N. Y.	E. F. Boehm.
Mar. 15	4,000	Spring creek	Monroe	Seth Green	Rochester, N. Y.	B. F. Shoddock.
Mar. 16	3,000	Cold, Crooked and Dyton brooks	Chautauqua	F. Sylvester	Sinclairsville	Jonathan Mason.
Mar. 16	20,000	Angelica creek and tributaries, Block and Baker creeks	Allegany	W. B. Eldridge	Angelica, N. Y.	Wm. Schwenep.
Mar. 16	10,000	Fish and Flintrock creeks	Lewis	A. Katsmeyer	West Leyden, N. Y.	A. Katsmeyer.
Mar. 19	8,000	Beaver river and tributaries	Lewis	Chas. Fenton	No. Four, N. Y.	E. F. Boehm.
Mar. 19	10,000	Roberts' pond	Oneida	F. J. Spriggs	Utica, N. Y.	E. F. Boehm.
Mar. 20	12,000	Flint creek	Yates	C. H. Husted	Potter, N. Y.	C. H. Husted.
Mar. 20	12,000	West branch Unadilla river and tributaries	Oneida	F. A. Holmes	Black Hill, N. Y.	H. Robinson.
Mar. 20	12,500	Woodhull lake	Herkimer	L. S. Hunt	Utica, N. Y.	F. Redband.
Mar. 21	4,000	Caledonia creek	Livingston	Seth Green	Rochester, N. Y.	B. F. Shoddock.
Mar. 22	4,000	Tributaries to West Canada creek	Herkimer	R. K. Brown	Newport, N. Y.	Otis Olds.
Mar. 26	10,000	Owego creek and tributaries	Tioga	W. L. Hoskins	Owego, N. Y.	F. A. Green.
Mar. 26	2,000	Libby and Andrews brooks	Onondaga	D. D. Candee	Syracuse, N. Y.	E. F. Boehm.
Mar. 26	2,000	Tributaries to Onondaga creek	Onondaga	Henry Loftie	Syracuse, N. Y.	
Mar. 27	6,000	Bishop, Putnam, Snooks, Edwards, Flattery and Enonyous brooks	Onondaga	L. Heuber, Sr.	Fayetteville, N. Y.	E. F. Boehm.
Mar. 27	4,000	West branch of west branch, Chenango river and tributaries	Madison	J. W. Clark	Buffalo, N. Y.	E. F. Boehm.
Mar. 27	10,000	Handsome, Buell and tributaries to Chenango river	Chenango	C. L. Easton	Sherburne, N. Y.	E. F. Boehm.
Mar. 27	8,000	White and Shingle Hollow creeks	Rensselaer	John Marshall	Hoosick Falls, N. Y.	John Marshall.
Mar. 28	8,000	Head waters Deer river	Lewis	C. F. Neibergall	Montague, N. Y.	G. Vandawalker.
Mar. 28	10,000	Head waters and tributaries of Salmon river	Lewis	G. Vandawalker	Osceola, N. Y.	G. Vanduwalker.
Mar. 29	10,000	Blanchard, Wright, Liffall, Munson, Lair, Block, Snake, Stoney, Alder, Meadow Rhodes, Gage, Pecks, Durey and Caroga brooks	Fulton	Henry Springer	Fulton, N. Y.	F. A. Green.
Mar. 29	10,000	Case and Van Auken brooks	Fulton	George Yost	Johnstown, N. Y.	F. A. Green.
April 3	1,000	Hoffman's brook	Monroe	John Lest	Irondequoit, N. Y.	G. M. Schwartz.
April 3	15,000	Sawmill, Peekskill and Canopis brooks	Westchester	B. R. Kittridge	New York	F. A. Green.
April 4	12,500	Cold Spring, Spaulding's and Wells creeks	Steuben	Z. L. Parker	Bath, N. Y.	E. F. Boehm.
April 4	6,000	North Cohocton creek	Steuben	E. H. Whitmore	Bloods, N. Y.	E. F. Boehm.

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DISTRIBUTION OF EUROPEAN BROWN TROUT FRY — (*Continued*).

Date.	Number of fish.	WATERS IN WHICH DEPOSITED.	County.	By whom ordered.	Post-office address.	By whom delivered.
April 4	3,000	Cohocton creek	Steuben	D. W. Lyon	Cohocton	E. F. Boehm.
April 5	12,500	Kellogg, Chamberlain and Spring brooks	Hamilton	W. W. Burnham	Wells, N. Y	E. F. Boehm.
April 6	15,000	Little Delaware and Platner brooks	Delaware	F. H. Griffis	Delhi, N. Y.	F. H. Griffis.
April 9	15,000	Wiston, Wheeler, Crandall and Christie brooks	Chenango	H. Whittenhall	Greene, N. Y.	F. A. Green.
April 9	15,000	Otsego creek and tributaries	Otsego	C. M. Lewis	Oneonta, N. Y.	F. A. Green.
April 10	5,000	Loxkill tributary to Lawkill	Dutchess	H. L. Cookingham	Red Hook, N. Y.	C. B. Hoffman.
April 10	12,000	New Suydam and Eccletyn's brook	Columbia	H. A. Feroe	Hudson, N. Y.	F. A. Green.
April 11	12,500	Coddington, Keynon Falls, Little Beaverkill and tributaries	Sullivan	A. W. Smith	Parksville, N. Y.	E. F. Boehm.
April 13	12,500	Mad River, Fish and Cobbe creek	Oneida	H. W. Leonard	Camden, N. Y.	F. A. Green.
April 13	12,500	Tributaries to Chenango creek	Madison	E. C. Bass, M. D.	Cazenovia, N. Y.	F. A. Green.
April 13	10,000	Toby, Griswold, Baker, Bogart, Willis and Huyzer brooks	Delaware	R. McKinnon	Masonville, N. Y.	A. Gardner.
April 16	5,000	East branch Unadilla river	Herkimer	H. H. Wheeler	West Winfield, N. Y.	F. A. Green.
April 16	3,000	Alder creek and tributaries	Oneida	Hon. J. D. Kernan	New York	F. A. Green.
April 17	4,000	Beaverkill and tributaries	Sullivan	G. H. Hawkins	Rockland, N. Y.	G. H. Hawkins.
April 17	4,000	Tributaries to Willowemoe and Beaverkill	Sullivan	W. E. Sprague	Roscoe, N. Y.	George F. Taylor.
April 17	5,000	Tremperskill and tributaries	Delaware	James Ballantine	Andes, N. Y.	W. K. Miller.
April 17	500	Spring brook	.....	C. S. Page	New York	United States Expr.
April 17	1,000	Tributary to Block creek	Monroe	George H. Smith	Rochester, N. Y.	George H. Smith.
April 18	6,000	Tributaries to Charlotte creek	Delaware	J. Davenport, Jr	Davenport, N. Y.	J. Davenport, Jr.
April 19	2,000	Tributaries to Neversink river	Sullivan	N. T. Hodge	Neversink, N. Y.	George T. Walker.
April 19	2,000	Larnes and Benson brooks	Sullivan	Ira Martin	Neversink, N. Y.	George T. Walker.
April 19	2,000	Eastern branch Neversink river	Sullivan	N. W. Dean	Neversink, N. Y.	George T. Walker.
April 19	3,000	Chamber Hollow and Mallory brook	Delaware	T. C. Brown	Hamden, N. Y.	J. A. Crawford.
April 19	2,000	Esopus creek	Ulster	C. T. Conant	St. Remy, N. Y.	C. T. Conant.
April 26	4,000	Venrooykill	Ulster	George Young	Kingston, N. Y.	F. A. Green.
April 27	1,000	Allen's creek	Monroe	William S. Little	Rochester, N. Y.	William S. Little.
June 18	8,000	Caledonia creek	Monroe	Seth Green	Rochester, N. Y.	E. F. Boehm.
Total..	397,500					

DISTRIBUTION OF CALIFORNIA TROUT, CALEDONIA HATCHERY, 1888.

April 18	12,000	Tributaries to Charlotte creek	Delaware	J. Davenport, Jr.	Davenport, N. Y.	J. Davenport, Jr.
April 18	500	Spring creek	.....	George S. Page	New York	American Express.
May 2	7,000	Plattekill and tributaries	Ulster	T. B. Keeney	Saugerties, N. Y.	F. A. Green.
May 15	28,000	Fall, Six-mile and Willow creeks	Tompkins	F. H. King	Ithaca, N. Y.	B. F. Shoddock.
May 28	85,000	Vail's, Faucher, Martin's, Fowles, Houston, Howell, Sawyer, Ball, Galloway, Wisner, Burt, Carr, Dusenbury, Demorest, Harrison and Fitzgerald streams	Orange	S. Hodden	Chester, N. Y.	E. F. Boehm.

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June 5	48,000	Wallkill river and tributaries	Orange	C. L. Brown	Newburgh, N. Y.	F. A. Green.
June 6	36,000	Orebed lake and tributaries	Washington.	James Potter	Whitehall	B. F. Shoddock.
June 6	60,000	Tributaries to Lake George	Warren	R. S. Coleman	Sandy Hill, N. Y.	B. F. Shoddock.
June 8	60,000	Chittenango creek and tributaries	Madison	J. B. A. Taylor	Chittenango, N. Y.	E. L. Marks.
June 8	36,000	Onondaga creek and tributaries	Onondaga	Henry Loftie	Syracuse, N. Y.	E. L. Marks.
June 11	30,000	Veghte, Lottridge, Gage, Cork, Centre, Plank, Durey, Case, Van Auken and Empire streams.	Fulton	George Yost	Johnstown, N. Y.	F. A. Green.
June 11	30,000	Lasher, Maloney, McVean lakes; Lofler, Parsons, Shults, McErwin, Brohes, Skinner, Marble, Blanchard, Stoney and Alder streams	Fulton	Henry Springer	Gloversville, N. Y.	F. A. Green.
June 11	6,000	Spring creek	Fulton	Seward Keck	Keck's Centre, N. Y.	F. A. Green.
June 12	1,000	Passaic river		G. S. Page	New York	American Express.
June 14	25,000	Tributaries to Silver lake	Wyoming	A. J. Wood	Perry, N. Y.	M. A. Green.
June 14	35,000	West Canada creek	Oneida	J. M. Schermerhorn.	North Gage, N. Y.	J. Schermerhorn.
June 19	35,000	Cold Spring, Spaulding's, Wells creeks.	Steuben	Z. L. Parker	Bath, N. Y.	F. A. Green.
June 19	25,000	North Cohocton creek and tributaries	Steuben	Z. L. Parker	Bath, N. Y.	F. A. Green.
June 19	12,000	Cohocton creek	Steuben	Z. L. Parker	Bath, N. Y.	F. A. Green.
June 19	35,000	Orebed lake and tributaries	Washington.	Jos. Potter	Whitehall, N. Y.	M. A. Green.
June 21	150,000	Spring creeks, tributaries to Geneva lake	Ontario	H. L. DeZeng	Geneva, N. Y.	E. L. Marks.
June 27	20,000	Tributaries to Silver lake	Wyoming	A. J. Wood	Perry, N. Y.	M. A. Green.
June 27	25,000	Oatka creek	Monroe	Seth Green	Rochester, N. Y.	B. Shoddock.
Total..	801,500					

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MISCELLANEOUS DISTRIBUTION OF FISH FROM CALEDONIA HATCHERY, 1888.

1887.

Dec. 28. Conesus lake, Livingston county: 500 salmon trout, five years old; ordered by William Nisbet, M. D., Avon, N. Y.; delivered with five teams by R. J. Nisbet, Charles Wadsworth, J. A. Dana, D. McLaughlin, and Daniel Lacy, Avon, N. Y.

1888.

Jan. 21. Conesus lake, Livingston county: 750 salmon trout, five years old; ordered by William Nisbet, M. D., Avon, N. Y.; delivered with nine teams.

Feb. 21. Conesus lake, Livingston county: 741 salmon trout, five years old; ordered by William Nisbet, Avon, N. Y.; delivered with nine teams.

April 25. Silver lake, Wyoming county: 1,000 rainbow trout, from four to seven years old; ordered by A. J. Wood, Perry, Wyoming county, N. Y.; delivered by M. A. Green and B. F. Shoddock.

June 5. Tributary to Wallkill river, Orange county: 150 yearling brook trout; ordered by O. M. Cleveland, Newburgh, Orange county, N. Y.

Nov. 24. Fulton chain fish hatchery, Herkimer county, N. Y.: 333,000 salmon trout eggs, 30,000 European brown trout eggs; delivered by E. L. Marks, superintendent Fulton Chain hatchery.

Dec. 14. A. G. Miller, superintendent Castalia Sporting Club, Castalia, Ohio: 5,000 European brown trout eggs, in exchange for 5,000 speckled trout eggs; sent by request of Fayette Brown, president, Cleveland, Ohio; shipped by American Express Company.

Dec. 14. Philo Dunning, Fish Commissioner, Madison, Wisconsin: 10,000 European brown trout eggs; by order Wm. H. Bowman, Commissioner; shipped by American Express Company.

Dec. 21. Schroon lake fish hatchery, Essex county, N. Y.: 200,000 salmon trout eggs; ordered by C. F. Taylor, P. O., South Schroon, Essex county, N. Y.; delivered by C. E. Benedict, Pottersville, Warren county, N. Y.

Dec. 26. Ragged lake fish hatchery, Franklin county, N. Y.: 50,000 speckled trout eggs, 7,000 European brown trout eggs; ordered by R. W. Jones, president Ragged Lake Rod and Gun Club, Syracuse, N. Y.; shipped by express to Malone, N. Y.

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1888.

Jan. 4. Mountain Home fish hatchery, Hamilton county, N. Y.: Wm. G. Stimson, superintendent; 25,000 speckled trout eggs, for West Canada creek and tributaries, 25,000 salmon trout eggs, for Big Rock, Pine and Morehouse lakes; ordered by Dr. C. M. Hitchcock, 196 Genesee street, Utica, N. Y.; shipped by American Express to Remsen, Oneida county, N. Y.

Jan. 5. P. A. M. Van Wyck, New Hamburgh, Dutchess county, N. Y.: 5,000 European brown trout eggs; shipped by American Express Company to J. G. Burrows, Fishkill village, Dutchess county, N. Y., for spring streams in Dutchess county.

Jan. 10. Bisby lake fish hatchery, Herkimer county: 15,000 European brown trout eggs; shipped by American Express to Philip Studor, Alder creek, Oneida county, N. Y.; ordered by Hon. R. U. Sherman, New Hartford, Oneida county, N. Y.

Jan. 12. Adirondack fish hatchery, Lake Brandon, Essex county, N. Y.: 15,000 German trout eggs; shipped by American Express to James H. Marks, superintendent, Bloomingdale, Essex county, N. Y.; ordered by Hon. R. U. Sherman, New Hartford, N. Y.

Mar. 12. Cold Spring fish hatchery, Cold Spring Harbor, L. I.: 5,000 rainbow trout eggs; shipped by American Express company.

Mar. 28. E. G. Blackford, Fulton market, New York: 25,000 rainbow trout eggs; to be sent to Herr Von Behr, Berlin, Prussia, in exchange for European brown trout eggs.

April 4. Schroon lake fish hatchery, Essex county, N. Y.: 125,000 California trout eggs; ordered by C. F. Taylor, P. O. South Schroon, Essex county, N. Y.; delivered by C. E., Benedict, superintendent.

April 4. St. Lawrence fish hatchery, M. B. Hill, superintendent: 125,000 California trout eggs; ordered by M. B. Hill, Clayton, Jefferson county, N. Y.; delivered by M. A. Green.

Total number of eggs distributed:

Salmon trout	558,000
Speckled trout	75,000
European brown trout	87,000
California trout	280,000
Total	**1,000,000**

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DISTRIBUTION OF ADULT FISH FROM WESTERN WIDE WATERS, ROCHESTER, N. Y., 1888.

Date.	NUMBER AND NAMES OF FISH.	Waters.	County.	By whom ordered.	P. O. address.	By whom delivered.
April 13	50 black bass	Canandaigua outlet	Ontario	H. P. Tiffany	Clifton Spring, N. Y.	H. P. Tiffany.
April 13	50 black bass	Chenango river	Chemung	C. L. Easton	Sherburne, N. Y	F. Redband.
April 16	30 black bass	Highland lake	Ulster	O. J. Tillson	Highland, N. Y	F. Redband.
April 16	77 black bass	Orange, Washington and Sterling lakes	Orange	C. L. Brown	Newburgh, N. Y	F. Redband.
April 16	40 black bass	...	Rockland	J. G. West	Haverstraw, N. Y	F. Redband.
April 16	15 black bass	Esopus creek	Ulster	T. B. Keeney	Saugerties, N. Y	F. Redband.
April 16	20 black bass, 75 bull-heads, 15 perch	Lathrop lake	Genesee	Lathrop Brothers	Darien Centre, N. Y.	Lathrop Brothers.
April 17	60 pike perch	Madison lake	Madison	G. A. Ford	Madison, N. Y	G. Schwartz.
April 17	50 black bass	Sears pond	Lewis	C. F. Netbergall	Montague, N. Y	G. Vandewalker.
April 17	50 black bass	Round pond	Sullivan	Joseph F. Wood	Roscoe, N. Y	M. Keener.
April 18	50 pike perch	Chenango river	Greene	H. Whittenhall	Greene, N. Y	F. A. Green.
April 19	60 black bass	New Rochelle pond	Westchester	C. O. Iselin	New York	J. Mason.
April 19	47 black bass, 13 Oswego bass	Dyken pond	Rensselaer	J. A. Schleicher	Albany, N. Y	J. Mason.
April 19	50 black bass	Crumhorn lake	Otsego	David Wilbur	Oneonta, N. Y	F. Redband.
April 19	60 black bass	Charlotte lake	Columbia	D. M. Livingston	New York	J. Mason.

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Total black bass	599
Total pike perch	110
Total bull-heads	75
Total yellow perch	15
Total Oswego bass	13
Grand total	812

DISTRIBUTION OF GERMAN CARP FROM CALEDONIA HATCHERY, 1888.

		Carp.
June 12.	H. C. Ferner, Pike, Wyoming county, N. Y.	15
June 12.	O. S. Babcock, Churchill, Monroe county, N. Y.	15
June 12.	John Davenport, Jr., Davenport, Delaware county, N. Y.	15
June 15.	John Schott, Coldwater, Monroe county, N. Y.	33
Aug. 10.	A. J. Tripp, Avon, N. Y.	21
Total		99

Account of shad hatching in Hudson river, at Catskill, N. Y.; temperature of water taken at 6 a. m., and 6 p. m. fish caught at John Pindar's fishery near Catskill Landing; operations conducted by Jonathan Mason, under direction of Seth Green, superintendent 1888.

Date.	NUMBER OF SHAD CAUGHT.	No. spawn taken.	No. fry deposited.	Temperature, water.
May 21	Fished, got no spawn	.....	.....	54 and 58
May 22	Did not fish	.....	.....	54 and 58
May 23	60 shad caught	170,000	.....	58 and 62
May 24	80 shad caught	420,000	.....	60 and 62
May 25	30 shad caught	125,000	.....	62 and 63
May 26	Did not fish (Saturday)	.....	.....	63 and 63
May 27	Did not fish (Sunday)	.....	.....	64 and 65
May 28	20 shad caught	50,000	.....	64 and 68
May 29	15 shad caught	75,000	140,000	67 and 69
May 30	80 shad caught	550,000	340,000	64 and 69
May 31	60 shad caught	350,000	120,000	66 and 69
June 1	90 shad caught	580,000	.....	67 and 69
June 2	Did not fish (Saturday)	.....	40,000	68 and 70
June 3	Did not fish (Sunday)	.....	65,000	64 and 67
June 4	40 shad caught	225,000	470,000	66 and 69
June 5	50 shad caught	160,000	325,000	69 and 71
June 6	12 shad caught	125,000	522,000	69 and 72
June 7	60 shad caught	175,000	.....	70 and 72
June 8	100 shad caught	515,000	.....	70 and 72
June 9	Did not fish (Saturday)	.....	202,000	70 and 72
June 10	Did not fish (Sunday)	.....	150,000	70 and 72
June 11	100 shad caught	500,000	110,000	70 and 71
June 12	75 shad caught	400,000	167,000	70 and 72
June 13	...	.....	453,500	.....
June 16	...	.....	450,000	.....
June 17	...	.....	360,000	.....
Totals	872	4,420,000	3,924,500	... .

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TOTAL NUMBER OF FISH AND EGGS DISTRIBUTED UNDER DIRECTION OF SETH GREEN, SUPERINTENDENT, 1888.

Salmon trout, fry	1,264,000	
Salmon trout, eggs	558,000	
Salmon trout, adult fish	1,991	
		1,823,991
Brook trout, fry	941,000	
Brook trout, eggs	75,000	
Brook trout, yearling	150	
		1,016,150
California trout, fry	801,500	
California trout, eggs	280,000	
California trout, adult fish	1,000	
		1,082,500
Brown trout, fry	397,000	
Brown trout, eggs	87,000	
		484,000
Shad, fry		3,924,500
German carp	99	
Black bass, adult fish	599	
Pike-perch, adult fish	110	
Bull-heads, adult fish	75	
Yellow perch, adult fish	15	
Oswego bass, adult fish	13	
		911
Total		8,332,052

DISTRIBUTION OF FISH FROM FULTON CHAIN HATCHERY BY E. L. MARKS, SUPERINTENDENT, 1888.

Distribution of Frost Fish.

May 7.	Fourth lake, Herkimer and Hamilton counties,	800,000
May 13.	Fourth lake, Herkimer and Hamilton counties,	500,000
May 14.	Lime Kiln lake, Hamilton county	100,000
May 14.	Fourth lake, Hamilton county	200,000
	Total	1,600,000

Distribution of Speckled Trout.

April 19.	Tributaries to Nicks lake	15,000
April 19.	Tributaries to north branch Moose river	15,000
May 7.	Beaver brook, tributary to Fulton chain outlet,	10,000
May 11.	Big and Little Moose lake streams	40,000
May 16.	Little Moose lake streams	15,000

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May	16.	Panther lake, tributary to south branch	10,000
May	16.	First lake, north branch	20,000
May	17.	Beaver brook tributary to chain outlet	2,000
May	18.	John's lake	10,000
May	18.	Second lake, north branch	15,000
May	21.	Lime Kiln lake	10,000
May	23.	Big Spring-hole lake	5,000
May	24.	Hatchery creek	10,000
May	25.	Morse lake	5,000
May	26.	Moose creek and tributaries to Sugar river	10,000
May	26.	Third lake creeks	10,000
May	26.	Fourth lake	13,000
May	26.	Pine creek, tributary to Fourth lake	5,000
May	26.	Seventh lake	15,000
May	26.	Eagle creek, tributary to Fourth lake	5,000
May	27.	Big and Little Spring-hole creeks	15,000
May	28.	Fourth lake creek	5,000
May	30.	Unknown ponds	5,000
		Total	265,000

Distribution of European Brown Trout.

May	21.	Lime Kiln lake	4,000
May	24.	Hatchery creek	2,000
May	25.	Morse lake	4,000
May	26.	Third creek lake	3,000
May	27.	Big and Little Spring-hole creeks	1,000
May	27.	Fourth lake, Meeker's creek	2,000
May	28.	North branch	5,000
		Total	21,000

Distribution of Salmon Trout.

May	19.	Third lake, Fulton chain	40,000
May	19.	Big Moose lake	60,000
May	19.	Morse lake	15,000
May	21.	Seventh lake, Fulton chain	50,000
May	21.	Lime Kiln lake	40,000
May	23.	Little Moose lake	40,000
May	27.	First and Second lakes, Fulton chain	50,000
May	28.	Fourth lake	100,000
		Total	395,000

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Distribution of Spawn.

Jan.	24. Shipped to Bisby hatchery, frost fish.....	250,000
Feb.	19. Shipped to Caledonia hatchery, frost fish.....	1,000
Feb.	19. Shipped to Caledonia hatchery, speckled trout,	5,000
	Total.....	356,000

Total Number of Fish and Spawn Distributed from Fulton Chain Hatchery, 1888.

Frost fish.....	1,851,000
Speckled trout.....	270,000
European brown trout.....	21,000
Salmon trout.....	395,000
Grand total.....	2,537,000

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REPORT ON HATCHING MUSKALLONGE.

To the Commissioners of Fisheries of New York:

GENTLEMEN.— On behalf of my late father, I herewith respectfully submit for your consideration a report of the experiment made at Chautauqua lake, New York, in the artificial propagation of the muskallonge:

While the attempt made in the spring of 1887 was not a success, in so far as the actual production of the young fry was concerned, our experiment was valuable, as we were able to undertake the work this season with a better knowledge of the needs of the case.

In order that we might make no mistake as to the spawning season of the muskallonge, I placed myself in communication with Mr. Eleazer Green, of Jamestown, New York, a gentleman who has observed the gradual decrease of this valuable fish in Chautauqua lake, and has manifested much interest in their artificial production, and with whom the following correspondence took place :

JAMESTOWN, N. Y., *November* 28, 1888.

SETH GREEN :

DEAR SIR.— Yesterday I drove to Ashville, passing up the west shore of Chautauqua lake. On my return I stopped at the home of a fisherman to get a muskallonge. I went to the lake with him and he had a box anchored a few rods from shore in which he had five or six alive, which he said he caught the day before (the twenty-sixth). I got one weighing about six pounds, and, upon dressing it, found spawn from which I took the inclosed. I send it to you, thinking it might give you information as to the time of spawning. It would seem to me to indicate that the spawning season was earlier than your assistant, Mr. Mason, who was here last spring, was informed that it was. I can not tell from the inspection of spawn as to its state of advancement, or when it would mature, though this seems to me to be well developed.

Should you wish any further information which I can obtain, write me and I will get it for you, as I am anxious that the propagation of muskallonge artificially be made successful.

Very truly yours.

ELEAZER GREEN.

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To which the following reply was made:

ROCHESTER, *November* 30, 1887.

ELEAZER GREEN, Esq., *Jamestown, N. Y.:*

DEAR SIR. — Yours received with spawn inclosed, which I was very glad to see. From its appearance I should judge that it would mature early in the spring — about the latter part of March — but in regard to this it would be difficult to say with certainty.

I would like to have you ascertain from this fisherman what he knows about the habits of the muskallonge, and also if he thinks there could be arrangements made whereby he could keep a number of the fish over until next spring. The money at our disposal will not admit of any very great outlay until we find out just how the work should be done, after which we could undoubtedly obtain the means to make a regular thing of it each season.

I am much interested in the matter and would like to see it made a success. I think there will be no difficulty in hatching them, provided we can manage to procure the ripe spawning fish alive.

Yours.

SETH GREEN.

JAMESTOWN, *December* 2, 1887.

SETH GREEN, Esq., *Superintendent, etc.:*

DEAR SIR.— Yours of the thirtieth ult. received yesterday. I am highly pleased at your interest in our muskallonge. They are a noble fish, and I trust that you will make the artificial propagation of them a success.

The fisherman from whom I obtained the fish from which I took the spawn sent you, would not be able to furnish reliable information as to the habits of the fish. I can get it, however, from others, and will do so.

Had the lake not already frozen over I could get, I think, fifteen or twenty by engaging a number of fishermen and then building a large crate and anchoring it in the lake over winter. Would they live in this way, think you, until spring? If you advise it I will try and do this if the ice goes out soon, so as to allow more fishing this fall. I think there would be no trouble in the spring getting all needed by drawing a seine.

I have another idea: There are large springs at one point near the lake shore; why not buy the property on which they are and start a hatchery? I believe that there is sufficient water and that the muskallonge would thrive there; as they frequent the lake at the point

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where these springs empty it is a favorable point for fishing them. The lay of the land about the springs is such that ponds could be made at small expense.

If any of my suggestions meet your favor, let me hear from you. I wish you could come here and go with me to see the springs.

Very truly yours.

ELEAZER GREEN.

ROCHESTER, N. Y., *December* 8, 1887.

ELEAZER GREEN, Esq.:

DEAR SIR.—Yours received. I shall be pleased to have you collect such information as you can from the fishermen on Chautauqua lake, and forward it to me. We shall undoubtedly be able to get some points of value from them.

The muskallonge would not live in crates all winter without feeding. I think we shall be able to manage some way to get them in the early spring.

I do not think it would be advisable to make any purchase of property until we learn how to hatch them. After this is done we will know what we require to go on with the work.

Yours.

SETH GREEN.

JAMESTOWN, N. Y., *February* 10, 1888.

SETH GREEN, *Superintendent, etc.:*

DEAR SIR.—Since writing you some time ago I have been talking with some of the Chautauqua lake fishermen about the time when muskallonge spawn, and from information and opinions received I am inclined to the belief that muskallonge spawn earlier than we had thought; that they spawn before the ice goes out, in fact.

I believe that it would be a good idea for you to come on here and catch a fish and examine the spawn, and to do so soon.

If you should come on I will supply the necessary appliances, some that I had on hand when the law prohibiting spearing through the ice went in effect.

Should you find it impossible to come, I will catch one and send you if desired, and permission is given me to do so.

Very truly yours.

ELEAZER GREEN.

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ROCHESTER, *February* 13, 1888.

ELEAZER GREEN, Esq., *Jamestown, N. Y.:*

DEAR SIR.— Yours of the tenth inst. is received and in reply will say that if you can do so I would like to have you catch a muskallonge and forward it to me. It may be possible, as you say, that they cast their spawn before the ice goes out. I hope you will not give others permission to catch any, as it might convey a wrong impression among the people and lead to trouble.

Yours.

SETH GREEN.

JAMESTOWN, N. Y., *February* 16, 1888.

SETH GREEN, *Superintendent, etc.:*

DEAR SIR.— Yours of the thirteenth inst. came duly to hand.

I will certainly not give any one permission to catch, and will catch only what I send you myself.

I am very desirous that the efforts to propagate muskallonge artificially may succeed. I am much interested in their increase and preservation in Chautauqua lake, as you will readily see when I state that I own "summer resort" property on the lake shore.

I had hoped that you would come and personally superintend the catching, but as you do not, I have caused an item to be published in one of our papers to the effect that I am acting under your directions and authority, and I shall act openly and publicly, so that my acts can not be misconstrued. I had a talk with one of our most intelligent fishermen yesterday, and he stated that he had caught muskallonge through the ice in March that would be discharging spawn when he took them from the water; that though the discharge was, of course, caused by the shock and the wound from the spear, yet he did not believe it would have occurred if the spawn had not been substantially ripe; he is quite positive that they spawn in March.

I will go up the first day that seems favorable and see what I can get for you; I shall send it by express to the address printed on your letter-heads.

Very truly yours.

ELEAZER GREEN.

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JAMESTOWN, N. Y., *March* 1, 1888.

SETH GREEN, *Superintendent, etc.:*

DEAR SIR.—I send you to-day by American Express a muskallonge caught this day, March first. I strongly suspect that it is a male, but as I did not feel at liberty to catch another I send it along. Please let me hear from you upon its receipt, and if you desire another, inform me at once, as the water is getting so roily that it is almost impossible to see them now.

Very truly yours.

ELEAZER GREEN.

ROCHESTER, N. Y., *March* 3, 1888.

ELEAZER GREEN, Esq., *Jamestown, N. Y.:*

DEAR SIR.—Yours received, and also muskallonge. I have made an examination of it. I found it to be a female which certainly would not have cast her spawn in less than a month from the time she was caught.

Yours.

SETH GREEN.

ROCHESTER, N. Y., *March* 24, 1888.

ELEAZER GREEN, Esq., *Jamestown, N. Y.:*

MY DEAR SIR.—If we make another attempt at muskallonge hatching it will not be a great while before we will have to be at it, and I write to inquire what assistance, if any, my man can depend upon from your people. The expense attending the experiment this season I expect will be somewhat greater than last, and there is no funds set apart by the commission for this purpose except what may be used from the amount allotted to the Caledonia hatchery, and I would therefore like to know if we can depend upon any financial aid from your people; and if so, how much.

I would also like to know if you have learned anything more concerning the spawning of the muskallonge since you wrote me last. Mr. Mason is of the opinion that they had not spawned when he was there last summer, which was from April twenty-seventh to May sixth, but in regard to this I think he must be mistaken. At any rate, we have yet to find out before we know for certain.

Yours.

SETH GREEN.

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JAMESTOWN, N. Y., *March* 26, 1888.

SETH GREEN:

DEAR SIR.— Yours of the twenty-fourth inst. just at hand.

I have learned nothing new about the spawning of the muskallonge, but if you desire it, will catch and send you another, if can do it at once, before ice and water get any worse than now. Please state amount of financial aid you desire, and I think I can raise it if not too much. I will let you know at once whether I can raise the amount you state.

Yours truly.

E. GREEN.

ROCHESTER, N. Y., *March* 27, 1888.

ELEAZER GREEN, Esq.:

DEAR SIR.— Yours received. If you can do so, I would like to have you catch me another muskallonge as soon as possible. If you could raise from twenty-five to fifty dollars it would help matters very much.

Yours truly.

SETH GREEN.

JAMESTOWN, N. Y., *April* 2, 1888.

SETH GREEN:

DEAR SIR.— I have not been able to get you another muskallonge, and the ice is now unsafe. Will try again as soon as the ice goes out.

I can assure you of at least twenty-five dollars towards expenses. Winter ice will be out within five or six days.

Yours truly.

E. GREEN.

JAMESTOWN, N. Y., *April* 10, 1888.

SETH GREEN, *Superintendent, etc.:*

DEAR SIR.— I have been unable since writing you last to procure a muskallonge. The water has not been still when clear since ice went out. I do not believe I shall be able to get one before you should come on, but will try for a day or two longer. I think it unsafe to wait much longer before coming. When will you be here?

Yours truly.

E. GREEN.

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ROCHESTER, N. Y., *April* 19, 1888.

E. GREEN, Esq. :

DEAR SIR.— Yours of the eighteenth inst. is received. I expect to send my man, Mr. Mason, to Jamestown about next week Tuesday, April twenty-fourth. I will have him call upon you or I will notify you in time so you can meet him at the train. I think I shall have him bring a seine and catch some of the muskallonge, if possible, and put them in cars anchored in the lake. I think this is the only way we can get ripe fish to take the spawn from. I hope we may be successful this season. Was glad to get your letter.

Yours.

SETH GREEN.

ROCHESTER, N. Y., *April* 21, 1888.

E. GREEN, Esq., *Jamestown, N. Y.:*

MY DEAR SIR.— Yours received and also muskallonge, which I have examined and am of the opinion that it would have spawned in about a week's time. I will have Mr. Mason start as soon as possible, and if he can do so he will reach Jamestown next Monday night ; if not, then Tuesday, sure.

I have talked with Mr. Mason and given him my ideas in regard to the matter, and you will find him a thoroughly honest and conscientious man, who will do all in his power to make a success. I regret exceedingly that I am not able to come myself, but my health is very poor and I have been confined to the house for about two months. I sincerely hope a success will be made, and from the appearance of the female you sent me I have strong faith that we will succeed.

Yours.

SETH GREEN.

The time having arrived for operations, Mr. Jonathan Mason, an assistant to the Caledonia hatchery and fish culturist of many years experience, was dispatched by Mr. Seth Green to Jamestown, on Chautauqua lake. The following is Mr. Mason's report, which will be found of interest :

April 23.— Left Mumford at 6.04 P. M.; arrived at Jamestown at 11.30 P. M.

April 24.— Met Mr. Eleazer Green and went up the lake with him four miles to Jones' hotel, and concluded to try and secure some muskallonge there.

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April 25.— Made fish-cars in the forenoon, in which to deposit the muskallonge, and fished with seine in the afternoon, but did not succeed in catching any muskallonge.

April 26.— Hired four men to assist in hauling seine; fished in forenoon; caught two muskallonge, both males; fished again at night; caught two males.

April 27.— Went to Long Point; caught one nine-pound female, not ripe, and one six-pound male; put them in fish car and towed them down to Jones' hotel.

April 28.— Fished all day; caught seven muskallonge, two small ones, put them back; one of them was a six-pound female, nearly spawned out; got about two thousand eggs, looking very nice and measuring ten to the inch.

April 29.— Did not fish, it being Sunday; looked the fish over confined in cars, but did not find any ripe.

April 30.— Fished all day; caught ten muskallonge; one large female weighing sixteen pounds, but could not get any milt, only by opening one of the males and pressing it out, secured about 60,000 eggs from the large one; at night the two females, weighing respectively nine and six pounds, were ripe, but the milt was again scarce, so opened two more males and took about 40,000 eggs from the two; put them in five shad-hatching boxes and kept them in still water over night.

May 1.— Stormy day; took the spawn across the lake to Southland's creek, where there was a little current; temperature of water, fifty-one degrees Fahrenheit.

May 2.—Cold west wind; spawn looking good; temperature of water, forty-five degrees A. M., fifty-two degrees P. M.

May 3.— The unimpregnated eggs commencing to have white spots in them; water fifty degrees A. M., fifty-two degrees P. M.

May 4.— Wind south and warm in forenoon; thunder-storm in the afternoon; water fifty degrees A. M., fifty-two degrees P. M.

May 5.— Cold north wind; spawn forming in clusters some; can see formation of fish in the eggs; water fifty degrees and fifty-two degrees.

May 6.— Water warming considerably; can see the formation of fish plainly; water fifty degrees and fifty-six degrees.

May 7.— Eggs doing well; the bad eggs are clustering, and can be taken out easily with small scoop net; temperature of water, fifty-two degrees A. M., fifty-eight degrees P. M.

May 8.— Eggs looking good; bad eggs most all taken out; the eggs are heavier than those of the shad; temperature of water, fifty-four degrees A. M., fifty-eight degrees P. M.

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May 9.—Eggs looking good; warm in the forenoon; had a heavy rain in the afternoon; made the creek very muddy and was obliged to stay with the eggs and tow the boxes so as to give them a circulation of water; temperature of water, fifty-six degrees A. M., fifty-eight degrees P. M.

May 10.—Water clearing up in creek; in the afternoon the wind came down the lake strong and was obliged to put the boxes again in the creek; 8.30 A. M. saw the first movement of the fish in the eggs; temperature of water, fifty-five degrees A. M., sixty-five degrees P. M.

May 11.—Some of the eggs commenced hatching; the fry were not as lively as should think they ought to be; temperature of water, fifty-six degrees A. M., sixty-six degrees P. M.

May 12.—Eggs hatching out fast in the morning; observed minnows trying to suck the fry through the wire on bottom of boxes and to overcome this I put on double bottoms; most all the eggs hatched out during the night; temperature of water, fifty-six degrees A. M., sixty-eight degrees P. M.

May 13.—Young fry doing well; cold day; temperature of water, fifty-six degrees A. M., sixty-five degrees P. M.

May 14.—Put the young fry in the lake, and as close an estimate as I can make there were 60,000 fry; they should have been kept longer, but as the place was not suitable I was obliged to turn them out.

On Mr. Mason's return from Chautauqua lake he brought with him a jar containing several of the young fry over which I kept a constant watch and examined them with a microscope daily; the young fry when first hatched are certainly the most helpless little creatures it has ever been my fortune to see; they are just three-eighths of an inch in length and show no movement of the gill covers or signs of breathing until they are nine days old, though with the aid of the microscope the heart action and circulation of the blood are seen to be strong and vigorous. So quiet did they lie for hours at a time that, if I had not been able to see the blood circulate, I should have been tempted to have thrown them away for dead. When the fry are eight days old they commence to show some signs of activity and are found clinging to the blades of grass placed in the vessels and also lying upon the partly submerged blades. At nine days old, with the aid of a microscope, can be discerned the mouth and gill covers in motion; the fry are then a half an inch in length and the yoke sac, which is of good size when first hatched, is two-thirds absorbed in water, the temperature of which average sixty degrees Fahrenheit.

When the fry are twelve days old the motion of the mouth and gills are plainly visible to the naked eye and the fish commence swimming

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about and have assumed a much darker color then when hatched. At fourteen days old the elongated head, characteristic of this species, is very perceptible, and at fifteen days the yolk sac is entirely absorbed and the fish commences looking for food. The fish are then ready to be turned into the water and seek their subsistence.

From the knowledge thus gained and upon consultation with Mr. Jonathan Mason, I should recommend to your honorable body that in order to make the work a success and obtain the best results, that a suitable hatchery building should be erected on the shores of Chautauqua lake at some convenient point which may hereafter be selected. The building need not be an elaborate affair; a plain frame structure, thirty-five feet long and thirty feet wide, would be sufficient. This should be equipped with from one to two dozen Chase automatic hatching jars in which to place the eggs until they reach the hatching point; and also twelve troughs about sixteen feet in length and fourteen inches wide; in these the fry should be kept until the yolk sac is absorbed and then turned into the open waters.

As there appears to be no suitable place on the lake where the necessary fall of water for the hatchery can be obtained, the water supply must, of necessity, be pumped from the lake into a receiving tank or reservoir and from thence distributed into the hatching apparatus. The amount of water necessary for the work is estimated at three inches of volume.

On consultation with Commissioner Sherman, I was requested to ascertain the cost of the building, equipments, engine, pump, etc., and herewith present the following statement:

Estimated cost of building	$500 00
Estimated cost of equipment	150 00
Cost of Shipman engine	200 00
Cost of pump	135 00
Estimated cost of forty rods seine	75 00
Estimated cost of row boat	30 00
Total	$1,090 00

The Shipman engine above referred to is described as follows: "Stationary engine No. 2, with cast iron boiler, full two-horse power, weight complete, 750 pounds; floor space, 52 × 32 inches; cylinder, three inches diameter; stroke four inches; pulley fourteen inches diameter, three inch face; 400 revolutions. Price, $200.

This engine is very simple in construction and a person of ordinary intellect can learn to manage it in from one hour to a half day's time.

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The fuel used is kerosene oil, costing about four and one-quarter cents per gallon and about one and one-half gallons are consumed per hour, making the cost per twenty-four hours not to exceed one dollar and fifty cents. The cost of the engine and pump includes putting them in place, with the exception of transportation and railroad fare of man.

At the reqnest of Mr. James Fitt, superintendent of the Shipman Manufacturing Company, in company with Mr. Mason, we visited such an engine as above described in actual operation and found it carrying a three-inch stream of water up an elevation of eighty feet and doing the work admirably.

If, after deliberation, your honorable body should decide to undertake this work the coming spring, permit me to suggest that it would be advisable to erect the building this fall in order that everything might be in readiness in time for operations.

The entire cost of last season's experiment, including Mr. Mason's time, was $120.78.

On my suggestion to Commissioner Sherman he thought it advisable to write to Chautauqua lake and ascertain if sufficient funds could not be raised at Chautauqua lake to defray, at least, a part of the expense of establishing the plant, concerning which the following correspondence took place:

ROCHESTER, N. Y., *August*.13, 1888.

E. GREEN, Esq., *Jamestown, N. Y.:*

MY DEAR SIR.— At the last meeting of the fish commission held at the Caledonia hatchery, August ninth, the artificial propagation of the muskallonge was discussed and it was decided to take active steps in that direction.

As you undoubtedly understand, by far the larger share of such hatching operations will be for the benefit of Chautauqua lake, and before going further in the matter it has been deemed advisable to write you and ascertain if there is not sufficient interest among the hotel people at the lake and those who make their homes there a whole or part of the year to provide the necessary plot of land and furnish the means for the construction of the building, the estimated cost of which is in the neighborhood of $500.

The commission are willing to maintain the hatchery after it is constructed and do all in their power to make the work a great success, and I have no doubt but that sufficient enthusiasm can be raised among your people to contribute the above amount toward a project which promises them such abundant returns.

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I should like to know, if possible, just what we may expect, by September first, so as to report at the next meeting of the commission to be held early in September.

The building should be erected in the fall so as to be ready for operations in the spring.

Kindly let me hear from you early as convenient and oblige,

Yours.

SETH GREEN.
Per C. K. G.

JAMESTOWN, N. Y., *August* 16, 1888.

SETH GREEN, *Superintendent, etc.:*

DEAR SIR.— Yours of the thirteenth inst. was duly received, and I have seen some of the parties interested in the artificial propagation of muskallonge in Chautauqua lake and am satisfied that something substantial can be raised towards establishing that hatchery here, but whether $500 can be raised I am not clear.

I will ascertain and write you more definitely before September first.

Yours truly.

E. GREEN.

Since writing the above I am in receipt of a letter from Mr. Eleazer Green in which he gives considerable encouragement that $500 can be raised by the people interested in Chautauqua lake to aid in establishing the work.

Respectfully submitted.

CHESTER K. GREEN.

ROCHESTER, N. Y., *August* 31, 1888.

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REPORT ON THE ADIRONDACK HATCHERY.

By James H. Marks, Superintendent.

To the Board of Fish Commissioners, State of New York:

Gentlemen.—I herewith transmit my annual report of the hatchery and distribution of fish from this hatchery under my charge, and the expenses connected therewith for the year commencing December, 1887, ending November, 1888.

Adirondack Hatchery.

The hatchery is in fine working order, has a row of thirty-two troughs, fourteen feet long each; capacity for brook trout and lake trout eggs, 6,000,000; capacity for young fish fry, 2,000,000.

Through the kindness of the Michigan fish commission I received a plan of an improved hatching tray for young fish fry. The use of this invention doubles the capacity; also enables me to retain all young fry within the hatchery until ready for shipment.

The amount of spawn taken up to date, see table:

Brook trout eggs	994,000
Salmon trout eggs	2,000,000
Frost fish eggs	1,000,000

General Remarks.

The season has been favorable for the collection of brook trout eggs in this region. Owing to high water, caused by frequent rains, the fish were enabled to run further upon the streams, giving them a chance to seek new places to cast their spawn. The season has also been favorable in regard to gathering spawn at the great western lakes, as reported by Mr. Roberts, who had charge of taking these eggs.

Improvements have been made as follows: One sleeping-room in hatchery has been completed and furnished with everything for the comfort of the employés. Grading has been done on the grounds. A fence has been built in front of the cottage. The land laying west of

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the hatchery, as mentioned in my last report, seven acres of which is under cultivation, the production of this, see following table:

Twenty-five bushels oats at fifty-five cents	$13 75
Three tons oat straw, eight dollars per ton	24 00
Seventy-five bushels potatoes at fifty cents	37 50
Fifteen bushels buckwheat, fifty cents	7 50
Thirty-six bushels turnips at forty cents	14 50
Five bushels beets and carrots	2 50
Total	$99 75

BROOK TROUT.

The number of eggs taken this year, 1888, is 994,000, an increase over last year of 279,000. Seven hundred thousand of this number were taken from the outlet of Lake Brandon, upon which the hatchery is located.

Other waters have been visited for this purpose of procuring brook trout spawn are as follows: Lake Placid, Coscade lake, Big Wolf pond, Round pond, Long pond, and outlet of Floodwood pond, Big Clear pond and Lake Brandon. Total number of eggs taken, 994,000.

FROST FISH EGGS.

The number of eggs taken this season is 1,000,000. To procure these eggs we use eel nets to capture the parent fish.

The supply of spawn was taken from Big Clear pond, Franklin county, N. Y.

DATE.	Temperature of air.	Temperature of water.	Direction of wind.	Weight of fish.	No. of female fish ripe.	No. of male fish for fertilizing.	No. of eggs taken.	
November, 1888	55	46	S. W.	3,600	5	5	5,000	
November, 1888	53	46	N. W.	4,000	6	6	5,000	
November, 1888	50	46	S. W.	4,800	16	16	60,000	
November, 1888	50	46	N. W.	.....	....	....	.....	Unable to lift.
November, 1888	50	46	N. E.	4,000	51	48	230,000	
November, 1888	45	46	N. W.	4,800	72	70	400,000	
November, 1888	50	46	S.	3,000	78	75	420,000	
November, 1888	45	45	S. E.	.....	....	....	.....	Unable to lift.
November, 1888	50	45	N. E	5,300	145	146	30,000	
November, 1888	35	44	N. W.	2,500	62	62	350,000	
November, 1888	45	44	W.	.....	....	....	.....	Unable to lift.
November, 1888	50	44	S. E.	.....	....	....	.....	Unable to lift.

SALMOM TROUT.

The number of eggs gathered from this fish was 22,000,000, I think when cleared up will leave 2,000,000, and were procured at High island, Lake Michigan. Mr. Roberts, who went to Lake Huron for this

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urpose, stated that he might be able to obtain a supply of eggs and eturn earlier than by going elsewhere. Not being able to find a suitable lace to procure the amount of spawn desired, went to High island, here the trout spawned fifteen days, taking them he met with good ecommodations, and through the kindness of Mr. Wiers he secured ie privilege of a fishing tug which he had chartered for that urpose. While obtaining a sufficient supply for the hatchery he lso deposited 100,000 upon the spawning grounds from where the sh were taken. I think the plant a good one and will give good esults, if continued, and also gives satisfaction to the fishermen that re are trying to help them as they are helping the commission.

Find attached to this a table of spawn gathered, from Mr. Roberts, while taking spawn.

DISTRIBUTION OF FROST FISH FRY FROM ADIRONDACK HATCHERY, 1888.

April	8.	50,000, Big Clear pond, Franklin county, N. Y.; ordered by Edwin Otis; P. O., Bloomingdale, N. Y.; delivered by James H. Marks.
	17.	50,000, Rainbow lake, Franklin county, N. Y.; ordered by James H. Wardner; P. O., Rainbow, N. Y.; delivered by James M. Wardner.
	25.	50,000, Big Clear pond, Franklin county, N. Y.; ordered by Joseph Otis; P. O., Bloomingdale, N. Y.; delivered by John G. Roberts.
	30.	50,000, Lake Brandon, Franklin county, N. Y.; ordered by R. U. Sherman; P. O., New Hartford, N. Y.; delivered by John G. Roberts.
May	5.	50,000, Lake Brandon, Franklin county, N. Y.; ordered by R. U. Sherman; P. O., New Hartford, N. Y.; delivered by James H. Marks.
	7.	300,000, Big Clear pond, Franklin county, N. Y.; ordered by S. Bowker and Rice, M. D.; P. O., Bloomingdale, N. Y.; delivered by James H. Marks.
	7.	100,000, Upper Saranac lake, Franklin county, N. Y.; ordered by D. W. Riddle; P. O., Saranac, N. Y.; delivered by John G. Roberts.
Total,		650,000

DISTRIBUTION OF GERMAN TROUT FROM ADIRONDACK HATCHERY, 1888.

May	29.	, Lake Brandon, Franklin county, N. Y.; ordered by R. U. Sherman; P. O., New Hartford, N. Y.; delivered by John G. Roberts.

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DISTRIBUTION OF SALMON TROUT FROM ADIRONDACK HATCHERY, 1888.

May 4. 15,000, McKenzie pond, Essex county, N. Y.; ordered by Duncan Cameron; P. O., Saranac, N. Y.; delivered by Duncan Cameron.

5. 50,000, Loon lake, Franklin county, N. Y.; ordered by Fred. W. Chase; P. O., Loon Lake House, N. Y.; delivered by Fred. W. Chase.

7. 30,000, Moose pond, Franklin county, N. Y.; ordered by M. L. Baldwin; P. O., Bloomingdale, Essex county, N. Y.; delivered by M. L. Baldwin.

10. 140,000, Upper St. Regis lake, Franklin county, N. Y.; ordered by Paul Smith; P. O., Bloomingdale, N. Y.; delivered by Paul Smith.

12. 40,000, Chateaugay lake, Franklin county, N. Y.; ordered by Warren Hatton; P. O., Chateaugay, N. Y.; delivered by Harry Barnard.

11. 40,000, Upper Saranac lake, Franklin county, N. Y.; ordered by D. W. Riddle; P. O., Saranac, N. Y.; delivered by John G. Roberts.

12. 50,000, Lake Brandon, Franklin county, N. Y.; ordered by R. U. Sherman; P. O., New Hartford, N. Y.; delivered by James H. Marks.

13. 70,000, Lower Saranac Lake, Franklin county, N. Y.; ordered by Milo B. Miller; P. O., Saranac, N. Y.; delivered by William Finegan.

13. 50,000, Lake Placid, Essex county, N. Y.; ordered by Stevens Brothers ; P. O., Lake Placid, N. Y.; delivered by John Stevens.

18. 30,000, Lower Ausable pond, Essex county, N. Y.; ordered by S. S. Smith, 59 Wall street, N. Y.; delivered by J. K. Brown.

23. 5,000, Round pond, Essex county, N. Y.; ordered by Weston and Otis; P. O., Cascadeville, N. Y.; delivered by J. H. Otis.

24. 100,000, Lake Brandon, Franklin county, N. Y.; ordered by R. U. Sherman; P. O., New Hartford, N. Y.; delivered by J. H. Marks.

25. 50,000, Meachem lake, Franklin county, N. Y.; ordered by A. R. Fuller; P. O., Meachem Lake House; delivered by A. R. Fuller.

29. 50,000, Upper Saranac lake, Franklin county, N. Y.; ordered by D. W. Riddle; P. O., Saranac, N. Y.; delivered by John G. Roberts.

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May 29. 25,000, Hoel pond, Franklin county, N. Y.; ordered by D. W. Riddle; P. O., Saranac, N. Y.; delivered by James H. Marks.

31. 50,000, Rainbow lake, Franklin county, N. Y.; ordered by James M. Wardner; P. O., Rainbow, N. Y.; delivered by James M. Wardner.

31. 50,000, Lake Brandon, Franklin county, N. Y.; ordered by R. U. Sherman; P. O., New Hartford, N. Y.; delivered by John G. Roberts.

June 1. 25,000, Colby pond, Franklin county, N. Y.; ordered by Milo B. Miller; P. O., Saranac, N. Y.; delivered by John G. Roberts.

1. 25,000, Lower Saranac lake, Franklin county, N. Y.; ordered by A. B. Alexander; P. O., Saranac, N. Y.; delivered by John G. Roberts.

1. 100,000, Lake Brandon, Franklin county, N. Y.; ordered by R. U. Sherman; P. O., New Hartford, N. Y.; delivered by James H. Marks.

1. 30,000, Moose pond, Franklin county, N. Y.; ordered by M. L. Baldwin; P. O., Bloomingdale, N. Y.; delivered by M. L. Baldwin.

1. 50,000, Upper Saranac lake, Franklin county, N. Y.; ordered by D. W. Riddle; P. O., Saranac, N. Y.; delivered by John G. Roberts.

2. 25,000, Big Clear pond, Franklin county, N. Y.; ordered by Joseph Otis; P. O., Bloomingdale, N. Y.; delivered by James H. Marks.

Total, 355,000

DISTRIBUTION OF BROOK TROUT FROM ADIRONDACK HATCHERY, 1888.

April 12. 5,000, Fay brook, Franklin county, tributary to Saranac river; ordered by Millard F. Otis; P. O., Bloomingdale, Essex county, N. Y.; delivered by James H. Marks.

13. 5,000, Mountain pond, Franklin county, N. Y.; ordered by Jesse Corry; P. O., Saranac, N. Y.; delivered Jesse Corry.

14. 5,000, Negro brook, Essex county, N. Y., tributary to Saranac river; ordered by J. C. Merrill; P. O., Bloomingdale, N. Y.; delivered by J. C. Merrill.

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April 14. 5,000, Lion brook, Franklin county, N. Y., tributary to Saranac river; ordered by Charles Bryant; P. O., Bloomingdale, N. Y.; delivered by Charles Bryant.

17. 20,000, Rainbow lake, Franklin county, N. Y.; ordered by James M. Wardner; P. O., Rainbow, N. Y.; delivered by James M. Wardner.

25. 10,000, Mill brook, Franklin county, N. Y., tributary to St. Regis river; ordered by Henry Phelps; P. O., Blue Mountain Lake house; delivered by W. H. Wardner.

25. 15,000, St. Regis river, Franklin county, N. Y.; ordered by W. H. Wardner; P. O., St. Regis Falls, N. Y.; delivered by W. H. Wardner.

25. 15,000, Follensby, Jr., pond, Franklin county, N. Y.; ordered by H. C. Baker; P. O., Brandon, N. Y.; delivered by George Whitney.

30. 15,000, White Face Mountain brook, Franklin county, N. Y.; tributary to Saranac river; ordered by R. L. French; P. O., Franklin Falls, N. Y.; delivered by R. L. French.

May 3. 15,000, Lake Titus, Franklin county, N. Y,; ordered by C. M. Amsden; P. O., box 345, Cummunipaw, Jersey City; delivered by Fred O. Cannard.

23. 25,000, Ray brook, Franklin county, N. Y.: ordered by Duncan Cameron; P. O., Saranac, N. Y.; delivered by Duncan Cameron.

4. 40,000, Lake Placid, Essex county, N. Y.; ordered by George H. Stevens; P. O., Lake Placid; delivered by George H. Stevens.

5. 25,000, Loon lake, Franklin county, N. Y.; ordered by Fred W. Chase; P. O., Loon Lake House; delivered by Fred W. Chase.

7. 15,000, Moose pond, Franklin county, N. Y.; ordered by M. L. Baldwin; P. O., Bloomingdale, N. Y.; delivered by M. L. Baldwin.

7. 25,000, Colby pond, Franklin county, N. Y.; ordered by Milo B. Miller; P. O., Saranac, N. Y.; delivered by Milo B. Miller.

10. 40,000, Upper and Lower St. Regis lake, Franklin county, N. Y.; ordered by Paul Smith; P. O., Bloomingdale, N. Y.; delivered by Paul Smith.

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May 12. 20,000, Chazy lake, Clinton county, N. Y.; ordered by Stows and Rogers; P. O., Dannemora, N. Y.; delivered by Stows and Rogers.

13. 30,000, Rocky Branch brook, Essex county, N. Y.; Potash brook, McNalley brook, Smith brook; tributaries to Ausable river; ordered by A. J. Merrill; P. O., Jay, N. Y.; delivered by A. J. Merrill.

14. 40,000, Mill brook, Orbist brook, Summer brook, Gulf brook, Rocky branch and McLother brook, Essex county, N. Y.; tributaries to Ausable river; ordered by A. S. Prime; P. O., Upper Jay; delivered by A. S. Prime.

18. 30,000, Upper Ausable lake, Essex county, N. Y.; ordered by S. S. Smith; P. O., New York city, No. 59 Wall street; delivered by John K. Brown.

18. 10,000, Rocky brook, Essex county, N. Y.; tributary to Ausable river; ordered by F. C. Parker; P. O., Keene Valley; delivered by F. C. Parker.

19. 5,000, McCalley pond, Franklin county, N. Y.; ordered by J. McMaster; P. O., Bloomingdale, N. Y.; delivered by J. H. Ferington.

19. 5,000, Mountain brook, Franklin county, N. Y.; tributary to Lower Saranac lake and McCalley pond; ordered by J. H. Ferington; P. O. Saranac, N. Y.; delivered by J. H. Ferington.

19. 35,000, Big Clear pond, Franklin county, N. Y.; ordered by Rice and Bowker; P. O., Bloomingdale, N. Y.; delivered by James H. Marks.

25. 50,000, Cascade lakes, Essex county, N. Y.; ordered by Weston and Otis; P. O., Cascadeville, N. Y.; delivered by J. H. Otis.

25. 30,000, Meachem lake, Franklin county, N. Y.; ordered by A. R. Fuller; P. O., Meachem Lake House; delivered by A. R. Fuller.

26. 10,000, St. Regis pond, Franklin county, N. Y.; ordered by Edwin Otis; P. O., Bloomingdale, N. Y.; delivered by John G. Roberts.

26. 5,000, Barnum pond, Franklin county, N. Y.; tributary to Lower St. Regis lake; ordered by W. H. Chase; P. O., Bloomingdale, N. Y.; delivered by W. H. Chase.

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May	26.	50,000, Lake Brandon, Franklin county, N. Y.; ordered by R. U. Sherman; P. O., New Hartford, N. Y.; delivered by John G. Roberts.
	29.	25,000, Hoel pond, Franklin county, N. Y.; ordered by D. W. Riddle; P. O., Saranac, N. Y.; delivered Willard Boyers.
	29	25,000, East pond, Franklin county, N. Y.; ordered by Dr. Ward, M. D., Albany, N. Y.; delivered by J. H. Marks.
	31.	20,000, Rainbow lake, Franklin county, N. Y.; ordered James M. Wardner; P. O., Rainbow, N. Y.; delivered by James M. Wardner.
June	1.	5,000, Shingle pond, Franklin county, N. Y.; tributary to Lower Saranac lake; ordered by Robert King; P. O., Saranac, N. Y.; delivered by Robert King.
	1.	25,000, Follensby Clear pond, Franklin county, N. Y.; ordered by D. W. Riddle; P. O., Saranac, N. Y.; delivered by James H. Marks.
Total,		265,000.

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REPORT ON THE FULTON CHAIN HATCHERY.

By E. L. Marks, Superintendent.

To the Commissioners of Fisheries:

I herewith present to you my report of the Fulton Chain fish hatchery from August 15 to December 1, 1888.

I was appointed to take charge of this hatchery August fifteen, and arrived here August 17, 1888. The first to be done was to get the hatchery in running order. The trays and hatching works were all tarred, a large plank feed pipe built and put down, giving the hatchery twice the amount of water of last year.

I have built besides the one at the hatchery, three ponds; one on Third lake, Fulton chain, six feet wide by fourteen feet long; one on Seventh lake, Fulton chain, six feet wide by twelve feet long; one on Big Moose lake, North branch, six feet wide by twelve feet long. These ponds were built to keep our spawning fish. After the spawn was taken the fish were turned back into the lakes. All of the work of building ponds and getting the hatchery in running order was done by myself alone, with the exception of one man who helped me six days. The appropriation for this place at the time would not allow any more help. September eighteenth, I hired two men and commenced fishing for trout. My men worked the head-waters of the Fulton chain, while I worked the lower lakes and tributaries to the south branch; we succeeded in gathering, up to November seventeenth, when the ponds closed with ice, 403,000 of brook trout. I expect to get from the western lakes 500,000 salmon trout, etc.; from Caledonia hatchery, 50,000 brown trout. This amount of spawn will be enough to fill the hatchery three times full after they are hatched. Our hatchery has only fourteen troughs, and leaving room for a stove takes all the room there is. The hatchery ought to be enlarged.

Frost Fish.

This finely flavored fish are only found in lakes with the salmon trout. They inhabit the deep, cold water in summer, and derive their name "frost fish" from the fact that they come to shallow water and streams

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to spawn the first few frosty nights in November. This is the only time they are caught during the year. Between Fourth and Fifth lakes, Fulton chain, is the stream they spawn. This stream has always been a battle-ground between the guides and others who went there to fish, to see who could get the most, but many of the guides who have helped our work along have gone without. This year they agreed to have it run so I could get the spawn. The guides hired a man to take charge of the stream, catch and salt the fish. Each guide paid his share of the man's wages and took his share of the fish. I gathered all the spawn. This plan worked to a charm. We had no trouble. We gathered of these 3,500,000. I have eleven of the Chase jars full and forty trout trays full besides, making the total amount in all:

Frost-fish taken at Fourth lake inlet	3,500,000
Salmon trout from western lakes	500,000
Brook trout from the Fulton chain waters	403,000
Brown trout from Caledonia hatchery	50,000
	4,453,000

The coming winter our work will be to clear up the grounds around the hatchery, cut seventy-five cords of wood, and, if this hatchery is kept running the coming year, will build an ice-house and make other improvements that are much needed.

In conclusion, I wish to mention the kindness of the Fulton chain guides by standing ready to help the work along. Their camps are always open for us, and I think the Fulton chain has got as good guides as any part of the woods.

E. L. MARKS,

Superintendent Fulton Chain Hatchery, Old Forge, N. Y.

December 1, 1888.

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Report on Cold Spring Harbor Hatchery.

By Fred Mather, Superintendent.

To the Commissioners of Fisheries of New York:

Gentlemen.—I have the honor to report to you the operations conducted at this station during the past year:

The total number of fishes hatched and planted was not as great as during the previous year, the deficiencies being in shad and tomcods, but the other species, which are handled at this station, turned out well. The United States Fish Commission coöperated with us, and furnished us with eggs of whitefish, brown trout, land-locked salmon, shad and lake trout eggs, the particulars of which will be found in the notes on these different fishes. The United States Fish Commission also paid all the expenses of the salmon work done here, including, during our fiscal year, the wages of Charles H. Walters and Oliver V. Rogers, our two experts, for November and December, 1887; January, February, March, April and October, 1888, as well as for Peter Gorman, another employé of ours, for May, 1888.

The New Hatchery.

In my last report I gave a hasty description of our new building, which has been admired by all who have seen it. A rude drawing of the front elevation was also given, but I now take pleasure in giving a photograph of the front and one side of the building, and of the engine-house. The gable end (north end) we call the front, and an old road, unused except by us, barely escapes being shown. The octagon building contains the salt-water pump which throws the water into a reservoir farther up hill than the picture covers. The fountain in front is the winter quarters of our golden ide, carp and of some ornamental wild fowl which are my own. These birds, wood-ducks, Chinese mandarin ducks, teal and widgeon, are distributed about the grounds in summer, and are greatly admired by visitors. They do not eat fish, as some ducks do, and we have reared trout, and even shad, in a pond twenty feet in diameter, where twenty or more of these birds were confined.

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The ponds are all behind the building, but the reservoir is to the west, a spout or trough entering the building is shown running into the embankment of the reservoir, which the limit of the lens can not show. The approach to the dwelling portion is well shown, and the advantage of having a man living above the hatchery has been often proved during the past year. It is occupied by Charles H. Walters, whom I call my foreman, because he is in charge when I am absent on other work, and I will here say that he is a man of sterling qualities and has been of more service to me than any man who has been in my employ since I came to Long Island. His family are comfortably situated and have all the conveniences of flowing water in bath, closet and wash-tubs, and Mr. Walters is a domestic man who appreciates this. He is there night and day, and when the ground is frozen and a thawy, rainy night comes to melt the snow rapidly, his lantern may be seen about the dams and sluices all night. Although my house is within a hundred yards of the hatchery, it is on a hill above, and business often calls me away, and I now feel that a flood or other accident would not wreck the station if human agency could prevent it. The dwelling portion is finished in yellow pine, with stained base boards, doors and moldings, and was all done, except the floors, by our employés, C. H. Walters and O. V. Rogers, who are very handy with tools. It is a great pleasure to me to bear witness to the ability and capacity of these men, both of them natives of this place, one an oysterman and the other a coaster, or painter, as business offered, but each a good man on the water (one is said to be the best yachtsman that lives in this harbor), a place that breeds sailors, and they are good fish culturists also, as they have been brought up under my supervision and are familiar with all improved apparatus.

A cupola, with a ventilating shaft from the hatching-room has been put on the building, which not only adds to the outside appearance but takes the moisture from what was an air-tight room, and keeps the windows comparatively free from ice, and the floors dry. I now have a hatchery with floors as dry and clean as those of a kitchen should be.

A SPAWNING FUNNEL.

The illustration shows the lines of what I use for preventing damage to trout eggs when they are being stripped from the fish. It is made of tin and has a three-quarter inch hole in the bottom, through which the eggs and milt flow into a pan below. In taking the eggs directly in a pan a trout will often slip from the hand and pound and scatter the eggs, thereby causing both loss and injury, but we find that this

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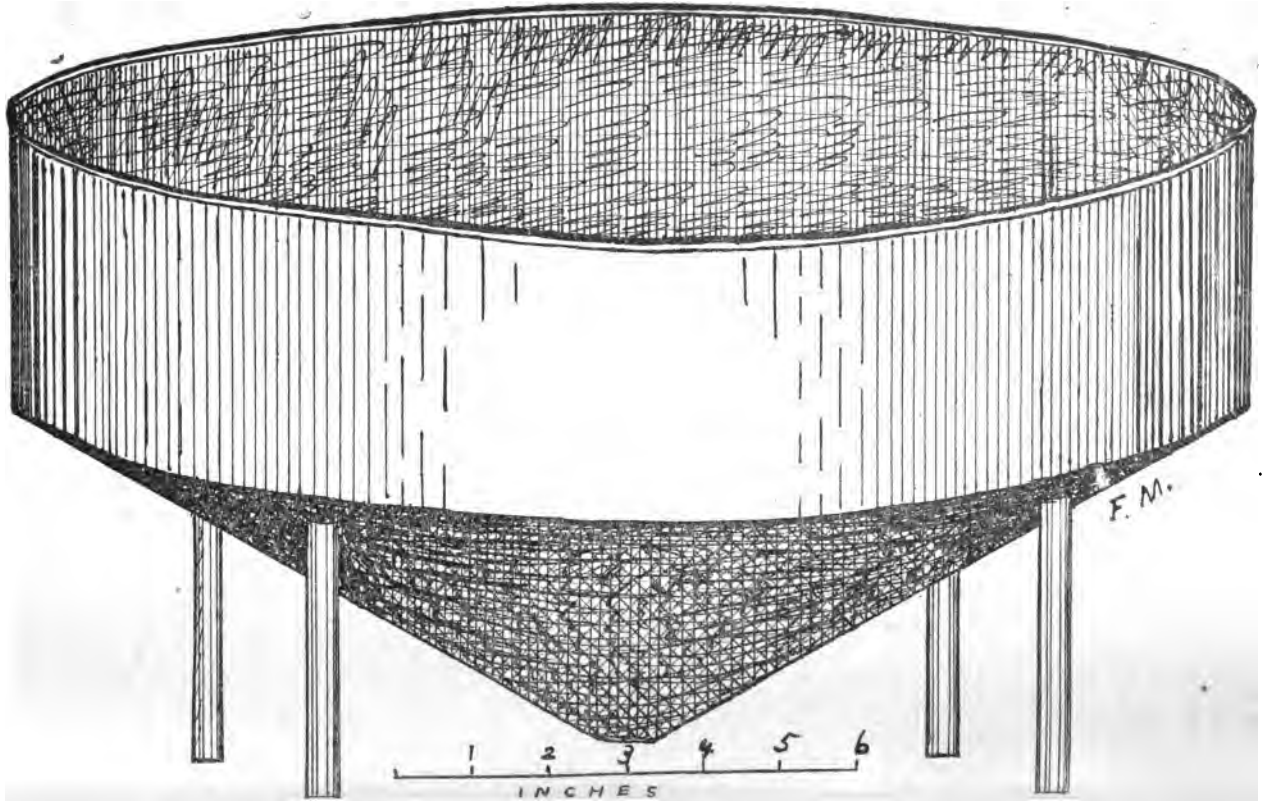

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device prevents this. The cylinder is sixteen inches in diameter, and the slope of the funnel should not be flatter than shown. At first the hole was made smaller than now, but I found that the eggs, which are only one-sixth of an inch in diameter, would not flow through a half-inch hole freely. I find it so useful that I think it worth figuring and describing, for several fish culturists who have seen it call it a good thing. By request I sent one to the United States Fish Commission exhibit at Cincinnati, and one is in the national museum, among the apparatus used in fish culture. Any tinsmith can make one from the drawing.

EELS.

These fish have been our greatest pest, kingfishers, minks and turtles coming next in the order named. The eels would come up from the salt water at night, through the wet grass, and get into our rearing-ponds and burrow into the sandy bottom, with only their protractile nostrils above the sand, and there live and forage by night. At times we would be able to locate one by the clean sand which it had turned over in burrowing; but if the eel was killed it only prevented further damage and did not restore the fry which had been devoured. Our new rearing-ponds, just completed, have plank bottoms, in which an eel will find it hard to hide. Some years ago the fish commissioners of Michigan came east and took a lot of young eels for planting in the great lakes, above the falls of Niagara. For the sake of fish culture at large, I hope that these fish went to sea and never returned, because they are so very destructive and so persistent in going wherever water goes. Near the salt water, the eel is a great nuisance in the trout-ponds, and its keen sense of smell leads it to a deposit of trout eggs, on which it gorges.

Few people know what obstacles an eel can surmount in order to reach waters above. At this place there is a mill-dam with a fall of a dozen feet or more, but the eels go around it at night, through the wet grass, and cross the road to get into the mill-pond. I have seen them in the grass, and their tracks across the road are sometimes plainly seen. I have found them in the morning stuck in the dry sand about our ponds, trying to get into them, and in digging for the foundation of our new building, they were shoveled out of the muck twenty feet from a pond. I have seen young eels, of from two to three inches in length, climb up the boards on the side of a flume near a dam, to the height of three or more feet, in their attempts to surmount the obstacle, and once saw them travel in the moss which grew in the top of an arch, through which the water flowed too swift for them to stem; a full report of this circumstance will be found in

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the Ninth Annual Report of the American Fishcultural Association, page 20, related by a man who was with me at the time. They clung in the moss as do flies on a ceiling.

As the main damage done by eels is among the fry which are under a year old, it may be possible to prevent it by planking the bottoms of the rearing-ponds.

In this connection I may be pardoned for introducing a flattering notice from the New York *Sun* of November 16, 1888, which shows the remarkable fecundity of the eel. It is headed "Nine Million Eggs in an Eel," and, although the subject-matter was published years ago, the *Sun* makes some editoral additions to it, and says :

"Scientists have known that the eel is an egg-producing fish for a dozen years or more, the Russian naturalist, Syrski, having first figured the ovaries of the female and the spermaries of the male, but how and where these minute eggs are laid is still unknown. In October the eels run down to salt water to breed, and in the spring the young eels ascend the brooks and rivers in swarms. As they are then some two inches long, and of the size of a darning needle, it is evident that they must have been hatched several weeks before, perhaps in February, to have grown so much from so small an egg.

"Mr. Fred Mather, the well-known fish culturist, has been estimating the number of eggs in a six-pound eel in November (in what is known to fishermen as 'eel fat,' but which are really the ovaries), and credits that eel with fully 9,000,000. Under the microscope he found that they measured eighty to the linear inch, and taking one ovary and dividing it by means of the most delicate scales known to science, he halved, quartered, and further divided the mass seventeen times, until he had a section small enough to count the eggs in it. This section represented 1=131,072 of the total number, and three sections were laboriously counted under the microscope. One of the sections contained sixty-eight eggs, making the total 8,912,896 eggs. The second held seventy-seven eggs, or 10,092,544 in the whole. The third section consisted of seventy-one, from which it would appear that there were 9,306,112 eggs in the eel. Taking the last as the medium number, Mr. Mather figures, in round number, that a six-pound eel contained 9,000,000 eggs.

"There have been many theories about the reproduction of the eel, some of them being wildly absurd, such as their being hatched by fresh water-mussels, or that the lamprey was the female and the so-called silver eel the male, etc. The fact is that the lamprey, miscalled 'lamper eel,' is a form of life lower than that of the true fishes, to

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which the eel belongs, and is a vertebrate with a cartilagenous skeleton instead of a bony one, has its skull imperfectly developed, and has no lower jaw. Superficially it appears like an eel but is not nearly related to it. Mr. Mather has done a service with his microscope in computing the eggs in a fish about whose breeding habits the majority of fishermen are in doubt."

I gave the *Sun* reporter the facts which relate to the lamprey, contained in the last paragraph, and they are the views of modern ichthyologists. There is almost as much difference, anatomically, between a trout and an angle-worm as between an eel and a lamprey. The latter has a backbone, it is true, but it is rather a rudimentary one, and its digestive system is but little above that of the worms.

BROOK TROUT.

By favor of Mr. Francis H. Weeks, we were permitted to take spawn from the fish in his private pond, but only obtained 7,000 eggs from them. Mr. Townsend Jones also extended the same privilege, and from his swamp we got 8,000 eggs. These, in addition to what our few stock fish gave us, made up 70,000 eggs; and as we hatched 25,000 for Mr. Francis T. Underhill, of Oyster Bay, which he purchased from Mr. James Annin, made the entire amount 95,000, from which we planted 86,700, as per table. The spawning season was from October first to December seventeenth.

BROWN TROUT.

From our own fish we had 43,650 eggs from sixty-four small females, and lost 9,378 eggs and fry before planting. The spawning season began November eleventh, and practically ended on the twenty-seventh of the same month, although one ripe female was found on December ninth, another on December eleventh, and three on January fourteenth.

From Europe I received, on account of the United States Fish Commission 55,000 eggs on March eighth, from Count von dem Borne, Berneuchen, per North German Lloyd steamer Trave, and from Oberburgomeister Carl Schuster, Frieburg in Baden, on account of Baron von Behr, president of the Deutschen Fischerei Verein, 43,000 eggs, making 98,000 eggs in all, the 12,000 dead in the packages not being counted. Of these eggs I repacked and shipped, by order of United States fish commissioner, Colonel M. McDonald, 76,000, in four lots of 19,000 each to the following States: Wisconsin, Michigan, Virginia, and Minnesota, leaving us an equal number. The tables show a distribution of 54,000 fry within the State.

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The young brown trout are growing well, and the fish is becoming a favorite in parts where its growth and game qualities are known. I do not think this fish spawns at as early an age as does our native brook trout.

LOCH LEVEN TROUT.

The Loch Leven trout in our ponds, raised from eggs presented to us by James R. G. Maitland, Esq., proprietor of the Howietown fishery at Stirling, Scotland, in 1886, the fry from which are now over twenty months old, but have not spawned. They are strong and of good size, and, as I said in my last report, page 76, we can distinguish this fish from the brown trout only by the ponds which they are in.

SAIBLING.

We received, January 19, 1888, a case of 20,000 saibling eggs from Germany, but their condition was bad. Eight thousand were dead on unpacking, and many living eggs were indented, and here I will say that, in my opinion, a fish egg which has dried to the point of indentation will never produce a strong fish. The egg may hatch, but the injury to the constitution of the fry is such that it will die, either before it takes food, or a few days after. In future I will never report eggs "in good condition," because they have not turned white, if they are indented, because they have become partially dry and this injures the embryo.

From the saibling eggs received on account of the United States Fish Commission, we sent 3,000 to Col. Elliott B. Hodge, of the New Hampshire commission, and as many to the United States station at Northville, Mich., all by order or Col. McDonald. We kept 1,000 saibling eggs, of which we sent the Caledonia station 417, which was one-half of them after being a few days in the troughs. We put out over 300 fry in a pond, but they disappeared, and not one is now alive. The eels, no doubt, took them.

GOLDEN IDE.

This beautiful fish spawned with us this year, for the first time. I made a little pond about twenty feet in diameter and eighteen inches deep, and supplied it with just water enough to replace loss by evaporation or filtration, so that the water would be warm. They were given some brush and water — plants to spawn among — and we have now nine young fish of seven months old, which are four inches long. Not a great number, but a beginning which shows us how to breed this fish in future. I have seen specimens of them in Germany which

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would probably weigh three pounds, and I believe they are eaten there, as well as being used for ornament. (See Rep. U. S. F. C., 1873–75, pp. 559, 562, on the value of this fish.)

RAINBOW TROUT.

We found a couple of spawners and two or three males, of this species, among our other trout, and took some eggs from them. They did not do well, however, and but few hatched. We have not tried to keep the rainbows because of two great faults which they have. The first of these is the low percentage of their eggs which can be impregnated, and, the second, the tendency of the fish to leave the streams and go to sea, if they can get there, and never returning. The difficulty in impregnating their eggs has made them unpopular with the fish culturists of the east, most of whom have only pond-reared and artificially-fed fish to work with, while on the Pacific coast there seems to be no complaint about their fertility. It has been my experience that the eggs of wild trout of all kinds, with which I have had experience, show a better percentage of fertile eggs than those kept in ponds, yet we get a fair percentage of fertile eggs from our pond-kept brook trout.

On March seventh we received 25,000 eggs of the rainbow trout from the United States Fish Commission station in California. The condition was bad, the temperature in the packing being up to sixty-five degrees, and 10,000 dead eggs were picked out. On March twenty-seventh we received a box containing 15,000, from the same source, which were in good order, only 1,000 being dead, and the eggs were cool and hard. This made 29,000 good eggs, and from these we distributed 23,500 fry, the remainder having been lost in the troughs, either as eggs or fry.

LAKE TROUT.

This fish, variously called "salmon trout," "salmon" and other names, has not done well in our ponds, in two attempts made to rear them, and I do not know that eggs have ever been taken from fish of this species which have been reared in confinement. We have none of these fish in our ponds. We received 90,000 eggs from the United States Fish Commission at Northville, Mich., in splendid condition. We lost 4,800 in the ordinary course of hatching, and 1,000 in one trough through a blunder of my own in leaving a window shade up at the head of a trough, causing the fry to huddle at the outlet screen and to smother the bottom ones. Had one of my men done this I would have shown him how careless he had been. The remaining fry, 74,200, were distributed as per accompanying table.

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WHITE FISH.

Although this fish has been placed in Long Island waters for the past four years we have no authentic report of their having lived. There have been rumors of their capture, but the law forbidding the use of nets in the lakes where we have made plantings, operates against getting tidings of them. I believe that nets have been used in Great pond, near Riverhead, from information casually received, and it is possible that they have done service in Ronkonkoma also, but I would like to be empowered to investigate these waters with such appliances as might be necessary to prove or disprove the presence of white fish in Long Island waters, purely in the interest of fish culture and of science in determining the southern range of this species, the southernmost limit of which is now believed to be Otsego lake, in Otsego county, N. Y.

On March second we received 1,000,000 white fish eggs from the United States Fish Commission station at Northville, Mich. The loss in eggs and fry was 50,000, a defective screen let out 150,000 into our ponds and the harbor, and 800,000 fry were planted on Long Island, as per table.

SHAD.

We received two lots of shad eggs from the United States Fish Commission on May twenty-second and thirty-first. The first lot of 2,000,000 were in bad condition and the fry died as soon as hatched. The cause for this may have been either temperature or severe jolting over the pavements of New York, I can not say. A second lot of 3,000,000 was received May thirty-first, and while many hatched, most of them died after emerging from the egg. From this lot there was planted at Albany 350,000 good strong fish which survived and had the strength to withstand transportation. A table of the temperatures of water during the shad hatching will be found among the tables at the end of this report. It will be seen that while it was rather low it never rose to the fatal point (above eighty degrees) nor down to the forties where the fry are feeble when hatched.

SMELTS.

The smelts were reported to be quite plenty last year in Oyster Bay, which connects with Cold Spring Harbor, and they are credited to our plantings. There is no good stream for the fish to spawn in at the head of our harbor and so they go into Oyster Bay. The blizzard of March twelfth, which blocked our railroads for eight days, interfered with getting spawning fish, or more eggs would have been taken. On March fifth, we got fifty fish, and on the twenty-third, seventy-five

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more. Between these dates we took 2,100,000 eggs. As usual, we experimented to learn in which manner these eggs would hatch the best. Some were taken on gravel in a tank, some were allowed to adhere to the sides of a tin pail, the others were first taken in pans and then placed in the hatching jars, but the best results were obtained from those taken in the tank, on gravel, with a running stream over them. We turned out 1,000,000 fry.

TOMCODS.

This fish has increased in size and numbers since we began hatching them, and this fall the shores were "lined with them," as the boys say. Although a small fish, which makes no show in the markets, the people of Long Island eat large numbers of them. Boys and men spear and "jig" them along the docks and sell them to the people who live here. The smaller ones sell at ten cents a dozen and the larger ones for more. Tomcods, or "frost fish" as some call them, have been taken here that were fifteen inches long and would weigh, perhaps, two pounds, although I did not weigh any. They were so plenty and so large that some people thought them to be codfish, and the Oyster Bay *Pilot*, of December 15, 1888, published the following:

"ARE THEY CODFISH?

"GREAT HAULS OF FISH TAKEN.—ARE WE NOT FEELING THE EFFECTS OF THE COLD SPRING HATCHERY?

"During the past week great hauls of fish have been made in different parts of our bay. Those who have followed the bay for years, say that never before have they caught similar fish in these waters. They generally are of the opinion that they are young codfish. Mr. Mather, of the Cold Spring hatchery, will be called to give his opinion, as an expert."

To this the following reply was made in the same paper, December twenty-ninth:

"LONG ISLAND STATION OF THE NEW YORK FISHERY COMMISSION,
COLD SPRING HARBOR, *December* 19.

"*To the Editor of the Pilot:*

"In your issue of the fifteenth inst., you ask, 'are they codfish,' and speak of an increased catch of some species of fish, which you think may be caused by the hatchery which I superintend. Perhaps you may be right in the latter supposition, if only partly right in supposing that the fish may be codfish.

"By favor of Mr. Funnell, of Huntington, Colonel Townsend sent some of the fish which proved to be the tomcod, or frost fish as they

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are called. They are exceedingly plenty here this year, and of large size, so large that I do not wonder that they were thought to be young codfish. We have been hatching this fish for the past four years and it is possibe that the increase is due to our efforts in this direction. The fish is a very good little one for breakfast, and, while there are not many sold in the city markets, the people of Long Island consume a great number of them, when they are plenty, the aggregate weight of which must be many tons in a season. We have only planted them in Cold Spring Harbor and Oyster Bay, because the people of the other harbors have not asked for them. We would be glad to have an interest awakened in the culture of salt water fishes, akin to that evinced by sportsmen for stocking streams with trout, and I know that when we begin with sea-fish our field broadens until it is, as the sailors say, 'hull down before the horizon.' We will probably begin the hatching of lobsters next spring. All who can remember thirty years back know how they have decreased in numbers and size, and increased in price. Then a two-pound lobster was a small one, now it is above the average weight.

"But, to return to the tomcod, and its differentiation from a small codfish of the same size. Both are subject to variations in color, and both have three dorsal and two anal fins, a profusion that is unusual in fishes. In the tomcod (*Microgadus tomcodus*) the nose is rounder and less prominent than in the cod (*Gadus morrhua*). The fin formula is as follows: Cod, first dorsal, fourteen rays; second, twenty-one; third, nineteen; tomcod, first, thirteen; second, seventeen; third, eighteen. There is also a difference in the cranium which only dissection will show, and which is not necessary to describe in this place. Those who care to go into a further detail may be referred to a monograph on the *Gadoids* by Dr. Theodore Gill, proceedings Academy of Natural Sciences, Philadelphia, 1865, or 'Synopsis of Fishes of North America,' by Jordan and Gilbert, Bulletin United States National Museum, No. 16, 1882, and other ichthyological works.

"We now have 4,000,000 eggs of the tomcod in the hatching jars which we will be pleased to show visitors, and can show them the embryo fish in the egg, under the microscope, in several stages of development. They will begin hatching early next month and as we are getting eggs daily, will continue hatching for perhaps three weeks later. Visitors are always welcome and will be shown every attention. Trout eggs can also be seen, in which the fish can be distinguished without the aid of a glass, and salmon and other eggs will soon be received.

"FRED MATHER,
"Superintendent."

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A year ago the tomcod eggs did not do well because the salt water was not working good and we were obliged to use fresh water, and the mortality was great. We only turned out 200,000, against 3,400,000 the previous year. From the above newspaper account it will be seen that we are doing better this season.

LAND-LOCKED SALMON.

On March 2, 1888, we received from the United States station at Grand Lake Stream, Me., a box containing 25,000 eggs of this fish; condition good; 200 dead eggs on unpacking. Two thousand of these fish were planted on Long Island, and I am anxious to see how they turn out.

SALMON.

As I have already laid before your honorable board a complete report of my investigations of the Hudson river as a salmon stream, I will merely say: The work of stocking the river with salmon has been done at the entire expense of the United State Fish Commission, Col. McDonald, the present commissioner, continuing the work begun by the late Professor Spencer F. Baird. There have been over 300 adult salmon caught in the river during the summer of 1888, which may have averaged twelve pounds each. The smallest weighed eight and the largest twenty-six pounds. For particulars see my special report on salmon, in the appendices.

On January 27, 1888, we received from the United States station at Orland, Me., five cases containing 280,000 eggs of Penobscot salmon; condition excellent; 120 dead; and on January thirtieth, three cases more with 220,000 eggs in as good order, 180 dead, making 500,000 in all. It may be well to say to the unprofessional reader that these eggs which are reported as dead would have died in the hatching-troughs, and were either unimpregnated or of that class which only develop to a certain point and then die under the most favorable conditions.

The eggs hatched exceedingly well in the new building, the loss in eggs and fry being less than 30,000 (29,200), or less than six per cent. and 5,800 were lost in transportation, 465,000 being planted, all but 20,000 of which went into the Hudson river, through its mountain tributaries.

THE SALT WATER DEPARTMENT.

It is gratifying to report that after many trials we now get pure salt water. The first attempt was with five-inch drain tile laid on a level around the meadow in a swampy place abounding in iron springs which leaked into the pipes in spite of us. I accidentally

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learned that there was a wooden pipe made in Michigan which would not only stand great pressure but would also serve as a suction pipe. After some correspondence and obtaining references, we put in this pipe. It is bored from pine logs and then all the sap wood is turned from the outside which is then banded with iron and the whole coated with asphaltum. The joints are tight, but for our suction pipe we pitched them after they were laid. The suction pipe is of two-inch diameter and 750 feet long, crossing a meadow the middle of which is as high as the engine, and falling as it approaches it. The lift of water is nine feet, and the pipe works to perfection. The water is then forced through a similar pipe into the reservoir above the hatchery, by the six-inch Ryder hot-air engine, and then led from there into the hatchery where we tap it with small brass cocks, thus practically having the ocean above us. The reservoir needs repairs to keep it from leaking, the ground having settled, and it should be arched over to prevent frogs, crickets, and other animals from polluting the water with their dead carcasses.

We are now ready to begin the hatching of lobsters, eggs from which may be obtained from the well smacks-which bring live lobsters to Fulton market. This, if successful, as I believe it will be, will be a grand thing for Long Island sound, which was once good lobster ground but is now barren of that animal.

Very respectfully.

FRED MATHER,
Superintendent.

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TABLE I.

DISTRIBUTION OF BROOK TROUT FROM COLD SPRING HARBOR IN 1888.

Date.	Number of fish.	SENT TO	Post-office address.	For what streams.	Messenger.
April 18.....	10,500	James F. Wood	Roscoe, Sullivan county	Reservor at hatchery in Sullivan county.....	James F. Wood.
20.....	10,000				
23.....	10,000	Thomas Manning	Carmel, Putnam county.....	Wang brook, Putnam county	O. V. Rogers.
26.....	5,000	John D. Jones.....	Seaford, L. I.....	Unqua lake, Queens county,	L. I. Express Company.
27.....	8,000	L. D. Huntington.....	Smithtown, L. I.....	Brush pond, Suffolk county,	O. V. Rogers.
27.....	8,000	S. F. Prentiss.....	Smithtown, L. I.....	Ponds of Brooklyn Gun Club,	O. V. Rogers.
May 5.....	8,000	Oxford Rod and Gun Club.....	Eastport, L. I.....	Ponds in Suffolk county.....	Peter Gorman.
15.....	3,000	.....	.....	Rearing ponds of hatchery.	
15*.....	24,200	F. T. Underhill.....	Oyster Bay, L. I.....	His own ponds.....	Delivered.
Total.....	86,700				

*Mr. Underhill purchased 25,000 eggs from private parties and we hatched them for him without charge, but as the fry were planted within the State, we record them as a portion of our work in stocking State waters.

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TABLE II.

DISTRIBUTION OF BROWN TROUT FROM COLD SPRING HARBOR IN 1888.

Date.	Number of fish.	SENT TO	Post-office address.	For what streams.	Messenger.
April 18	1,500	James F. Wood	Roscoe, Sullivan county	Reservoir at hatchery	J. F. Wood.
20	500			Streams, Sullivan county	
27	8,500	W. N. Spurge	Smithtown, L. I.	Nissequogue river, L. I.	O. V. Rogers.
May 3	10,000			Lake George	A. N. Cheney.
4	5,000	Jones & Hewlett	Cold Spring Harbor	St. John's lake	Wm. E. Jones, Jr.
5	1,500	Anchor Brewing Company	Dobbs Ferry, Westchester Co.		Long Island Express Co.
5	3,000	Oxford Rod and Gun Club	Eastport, L. I.	Pond in Suffolk county	Peter Gorman.
9	5,000	George Mole	Freeport, L. I.	In Suffolk county	Long Island Express.
9	3,000	D. H. Rose	Southampton, L. I.	In Suffolk county	Long Island Express.
9	2,500	Hewlett Scudder	Northport, L. I.	In Suffolk county	H. Scudder.
14	2,500	C. E. Durkee	Saratoga, N. Y.	Glen Brook, Warren county	O. V. Rogers.
14	2,500	C. E. Durkee	Saratoga, N. Y.	Wolf creek, Warren county	O. V. Rogers.
16	3,000	E. R. Wilbur	*Forest and Stream*, N. Y.	Green river, Suffolk county	C. H. Warren.
16	2,500	H. N. Ruland	Huntington, L. I.	In Suffolk county	Hurd & Gould.
20	3,000	Francis H. Weeks	Cold Spring Harbor	In Suffolk county	O. V. Rogers.
Total	54,000				

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TABLE III.

DISTRIBUTION OF RAINBOW TROUT FROM COLD SPRING HARBOR IN 1888.

Date.	Number of fish.	SENT TO	Post-office address.	For what streams.	Messenger.
April 25	5,000	F. H. Forbes	Old Colony S. S. Co		Long Island Express.
28	1,000	B. F. Van Valkenburgh	288 Greenwich street, N. Y.	In Greene county	Long Island Express.
May 4	5,000	Jones & Hewlett	Cold Spring Harbor	St. John's lake	William E. Jones, Jr.
5	1,000	R. O. Frost	Middle Hope, Orange county	In Orange county	Long Island Express.
9	5,000	James A. Murtha	South Oyster Bay, L. I	Massapequa lake	Long Island Express.
13	5,000	S. D. Phelps	Glen Cove, L. I	Pond of starch works	Long Island Express.
16	1,500	H. N. Ruland	Huntington, L. I	In Suffolk county	S. Gould.
Total	23,500				

TABLE IV.

DISTRIBUTION OF LAKE TROUT FROM COLD SPRING HARBOR IN 1888.

Date.	Number of fish.	SENT TO	Post-office address.	For what lakes.	Messenger.
April 20	30,000	James F. Wood	Roscoe, Sullivan county	In Sullivan county	J. F. Wood.
23	30,000	Brewsters station	Putnam county	Glenida and Gilead	O. V. Rogers.
May 2	5,200	E. S. Travers	Manhassett, L. I	In Queens county	
3	19,000	A. N. Cheney	Glens Falls	Lake George	A. N. Cheney.
Total	84,200				

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TABLE V.

WHITE FISH DISTRIBUTED FROM COLD SPRING HARBOR IN 1888.

Date.	Number of fish.	WHERE PLANTED.	Messenger.
March 29.....	400,000	Lake Ronkonkoma, Long Island.....	O. V. Rogers.
March 30.....	400,000	Great pond at Riverhead, Long Island....	Peter Gorman.
Total	800,000		

TABLE VI.

TOMCODS DISTRIBUTED FROM COLD SPRING HARBOR IN 1888.

Date.	Number of fish.	WHERE PLANTED.	Messenger.
February 15..	200,000	Cold Spring Harbor (salt water).....	Fred Mather.

TABLE VII.

SMELTS DISTRIBUTED FROM COLD SPRING HARBOR IN 1888.

Date.	Number of fish.	WHERE PLANTED.	Messenger.
April 12.....	500,000	At head of Cold Spring Harbor.....	C. H. Walters.
April 30.....	500,000	At head of Cold Spring Harbor.....	Fred Mather.
Total	1,000,000		

TABLE VIII.

SHAD DISTRIBUTED FROM COLD SPRING HARBOR IN 1888.

Date.	Number of fish.	WHERE PLANTED.	Messenger.
June 4.....	350,000	In the Hudson at Albany	O. V. Rogers.

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TABLE IX.

LAND-LOCKED SALMON DISTRIBUTED FROM COLD SPRING HARBOR IN 1888.

Date.	Number of fish	APPLIED FOR BY	Where planted.	Messenger.
May 3	10,000	A. N. Cheney.....	Lake George, Warren Co..	A. N. Cheney.
May 5	2,000	Oxford Rod and Gun Club.	Eastport, L. I.....	P. Gorman.
May 8	12,000	W. Holberton.....	Salmon lake, Hamilton Co.	*P. Gorman.
Total..	24,000			

*These fish were delivered to Mr. Holberton's agent at North Creek, Warren county, by Mr. Gorman, who took them with him when taking 35,000 salmon fry for Minerva brook, near Olmsteadville. Mr. Holberton, who is with the firm of Abbey & Imbrie, fishing tackle dealers, at 18 Vesey street, New York, writes that "this lake is not far from Smith's lake, Hamilton county, and is on the ordinary railroad map, though not named there."

TABLE X.

DISTRIBUTION OF PENOBSCOT SALMON FROM COLD SPRING HARBOR IN 1888, ON ACCOUNT OF THE UNITED STATES COMMISSION OF FISH AND FISHERIES.

Date.	Fish supplied.	Loss in transportation.	Fish planted.	STREAM.	Tributary of	Messenger.
April 27	20,000	.....	20,000	Nissequoge river..	L. Island Sound.	O. V. Rogers.
April 30	50,000	2,000	48,000	Balm of Gilead ...	The Hudson.....	C. H. Walters.
May 1	50,000	1,000	49,000	Carr's brook.....	The Hudson.....	P. Gorman.
May 7	50,000	300	49,700	Thirteenth brook..	The Hudson.....	O. V. Rogers.
May 8	35,000	300	34,700	Minerva brook....	The Hudson.....	P. Gorman.
May 10	50,000	200	49,800	Clendon brook	The Hudson.....	O. V. Rogers.
May 14	55,000	500	54,500	Roaring brook	The Hudson.....	O. V. Rogers.
May 15	55,000	700	54,300	Raymond brook...	The Hudson.....	P. Gorman.
May 17	50,000	200	49,800	Roblee brook.....	The Hudson.....	O. V. Rogers.
May 18	50,000	600	49,400	North creek	The Hudson.....	P. Gorman.
Total..	465,000	5,800	459,200			

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TABLE XI.

TOTAL NUMBER OF FISH DISTRIBUTED FROM COLD SPRING HARBOR IN 18

Brook trout	86,7
Brown trout	54,0
Rainbow trout	23,5
Lake trout	84,2
White fish	800,0
Tomcods	200,0
Smelts	1,000,0
Shad	350,0
Land-locked salmon	24,0
Penobscot salmon	459,2
Total	3,071,6

TABLE XII.

TEMPERATURE OF WATER AT COLD SPRING HARBOR DURING THE HATCHI SEASON OF 1887-88.

SEASON OF	Number of days.	Highest temperature.	Lowest temperature.	Mean temperature of the season.
Trout	Oct. 26 to April 18, 176 days	Nov. 8, 46° April 17, 48°	Feb. 10 and 11, 35°	40.51°
Salmon	Jan. 27 to April 19, 84 days	April 17, 48°	Jan. 30 and 31, 38°	39.35°
White fish	March 2 to March 22, 21 days	Several days 42°.	March 3, 39°	40.56°
Smelt	March 6 to 24, 19 days.	42°	40°	40.8°
Shad	May 22 to June 4, 14 days	65°	58°	60°

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SALMON IN THE HUDSON RIVER.

the Commissioners of Fisheries of the State of New York.

GENTLEMEN.— After investigating the catch of salmon in the Hud-
n river, and before making my report to Colonel Marshall McDonald,
mmissioner of Fisheries for the United States, under whose direc-
n the stocking of the river with this fish is done, I asked his per-
ssion to furnish your board with a copy of it, which was granted,
the following letter:

UNITED STATES COMMISSION OF FISH AND FISHERIES,
MARSHALL MCDONALD, *Commissioner.*
WASHINGTON, D. C., *November* 30, 1888.

ED MATHER, Esq,
Cold Spring Harbor, N. Y.:

DEAR MR. MATHER.— I think it desirable that information of general
terest, prepared under the auspices of the United States Fish Com-
ission, should have as wide circulation as practicable. The matter
your report should interest very much the people of New York,
d by being published early, would tend to awaken and increase
terest in regard to the protection and improvement of the salmon
heries of the Hudson.

You are authorized, therefore, to furnish a copy of the same to the
ate Fishery Commission for their information, and for printing if
ey so desire.

Very truly yours.

M. McDONALD,
Commissioner.

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REPORT ON THE SALMON IN THE HUDSON RIVER.

By Fred Mather.

Col. M. McDonald,

Commissioner of Fisheries, Washington, D. C.:

Dear Sir.—In compliance with your order of July 11, 1888, I have made an examination of the Hudson river from its mouth to the tributary trout streams of Warren county, N. Y., with a view to learning the number of adult fish captured during the last season; the possibilities of taking salmon eggs in sufficient numbers to warrant the establishment of a temporary station for this purpose; to also learn the character of the small streams and determine which give promise of the best conditions for developing the young fish during their river life; and to ascertain the height and character of the natural and artificial obstructions to the ascent of salmon, and herewith forward my report on this work.

Planting of Salmon.

With the exception of some quinnat, or chinook, salmon planted in the Hudson ten or a dozen years ago by the New York Fishery Commission, which have never been heard from, I believe that all the plantings of *S. salar* in the river have been done under my immediate supervision.

In 1880 I suggested to the late Professor Spencer F. Baird, then Commissioner of Fisheries, that the streams of the upper Hudson had all the requisites for growing young salmon, and he agreed with me that it might be possible that the river had never been a salmon river because of the natural obstructions to the ascent of the parent fish. On January 16, 1882, I was ordered to try to obtain a hatchery near New York city for the purpose of hatching salmon for the Hudson, and secured one from Mr. Thomas Clapham, at Roslyn, on the north side of Long Island, about twenty-three miles from the city, and in the spring planted 225,000 fry in the streams of Warren county, as well as some in other waters (see report United States Fish Commission, 1882, page 876). In January, 1883, I was appointed superintendent of the new hatching station of the New

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York Fishery Commission at Cold Spring Harbor, Long Island, and transferred the work of salmon hatching there, where it has since been conducted.

The following plants have been made in the tributaries of the river:

	Fry.
1882	225,000
1883	244,900
1884	424,700
1885*	319,100
1886	297,573
1887	140,450
1888	440,000
*Total	2,091,723

Where the odd figures occur I would explain that there was no pretense to actual count, but, from the measured number of eggs there was an actual count of the losses of eggs and fry, my men being instructed to keep such a record, and the loss being deducted left odd numbers which were always added in the last shipment; except in cases of loss in transportation when they are deducted from that particular shipment.

The streams in which the fry were placed are good trout streams, but there exists great confusion as to their names. For instance, while on this investigation I asked Nate Bennett, a well known Adirondack guide, where "Roaring brook" was, and he said that it was only another name for "Thirteenth brook." This happened at the North River Hotel, and the latter brook empties into the Hudson about one hundred yards above; but others said that "Roaring brook" was a tributary of North creek. As it will be found that a brook by this name was stocked in four different years I can not say which one received the two plantings of 1883, made by O. B. Hewitt; nor in 1884, by F. A. Walters, because the men are no longer in my employ and I do not know their addresses. The plantings in "Roaring brook," made in 1886, by C. H. Walters; and in 1888, by O. V. Rogers, were in the stream emptying into North creek. Depending as we must, on the natives for the nomenclature of these little mountain streams, we find the names are much mixed, and the maps do not name these little brooks. My foreman, C. H. Walters, tells me that Eldridge brook, stocked by him in 1886, is the stream also known as

*And 150 yearlings.

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"Balm of Gilead," and that it had two plantings in that year in consequence of its double name. I have now a better knowledge of the smaller brooks, and will try to avoid confusion of this kind in the future. The following is a list of the brooks, with the number of salmon placed in them:

Carr's brook, also called "Deleby brook," comes into the Hudson from the east, a mile or two above North Creek, the northern terminus of the Adirondack railroad, is a good trout stream and is one of the best for planting salmon, as it contains insect larvæ and crustaceans in apparent plenty. It received the following plants:

1882	35,000
1883	49,800
1884	39,200
1886	69,800
	49,800
1887	49,000
1888	50,000
Total	342,600

Glen brook comes in from the west at the station of the Adirondack railroad called The Glen, and is some twenty or thirty miles below North Creek. It received 50,000 in 1882 and 39,000 in 1884. It is said to be a good trout brook.

Balm of Gilead brook, also known as "Eldridge brook," is fine stream which comes into the river from the west, half a mile below the village of North River, received the following plants:

1882	40,000
1883	49,700
1884	39,000
1885	*58,973
1886	*59,800
1887	49,700
1888	50,000
Total	347,173

* These two plants were made in the same brook owing to the confusion of names by the residents in recommending it.

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Raymond brook.—This is a good stream which comes in from the west two or three miles above North Creek and below Balm of Gilead. It appears in the earlier reports as "Raymont." It had:

1882	45,000
1883	39,000
1884	38,000
1885	49,800
1886	49,500
1888	50,000
Total	271,300

Roblee brook.—This is not a good stream because the lower portion is dry in summer. It runs through the village of North Creek and is a strong stream most of the year. In 1888 it had 50,000 fry, but I would not recommend it for future stocking. There is another brook by this name which empties into North creek.

North creek. — This is a good stream. It has a dam and a tannery at its mouth, in the village of that name. It directly received:

1884	38,900
1887	41,750
1888	55,000
Total	135,650

Besides this it had plants in one of its tributaries, known as Roaring brook, given below.

Roaring brook. — This stream is referred to in the sixth paragraph above, and I have reason to believe that all the plants made were in the tributary of North creek, and not in the Thirteenth brook. Those of 1886, and of 1888, certainly were. The stream received:

1883 (two plants)	67,400
1884	38,800
1886	59,800
1888	50,000
Total	216,000

Thirteenth brook.— A rapid stream which comes from the west and empties at the village of North River. It is sometimes dammed for

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logging purposes, but was avoided on the years when it was so used. It received:

1885*	79,900
1888	50,000
Total	129,900

Beaver Meadow brook is a tributary of Indian river, which enters the Hudson in Essex county. The brook crosses the stage road from North River to Blue Mountain Lake about eight miles from the former place, and if the roads were better in the spring this would be a good point of deposit. In 1883 there were 39,000 salmon planted in this stream.

Indian river received 36,200 in 1884.

Minerva brook was stocked, in 1888, with 35,000 salmon at Olmsteadville, Essex county. It is a tributary of the Schroon river which enters the Hudson at Warrensburgh, some twenty miles, as the crow flies, below, but by the course of the river is nearly double that distance. This stream is a celebrated trout brook and I strongly recommend it for salmon.

Loon lake empties into the Schroon at Starbuckville, Warren county, It received 38,600 salmon in 1884. I am not certain that lake plantings are good for these fish. I prefer mountain brooks.

Gulf brook and *Hokum pond* received 55,000 fry in 1882. Hokum pond is in the town of Johnsburgh, Warren county, southwest of the village of North Creek. Its outlet is Mill brook (not Mill creek, in the same county), which is tributary to North creek. Gulf brook empties into Mill brook near the outlet of Hokum pond.

Kelso brook was stocked with 37,000 in 1884. It empties into Minerva brook a mile above Olmsteadville, in Essex county, and is therefore tributary to the Schroon river. Another stream, with the same name, empties into Carr's brook in the town of Chester, Warren county.

Cedar river comes from the southwest and joins the Hudson at Essex county, about three miles above the point where Indian river comes in. It rises in the Cedar lakes, near the middle of Hamilton county, and flows northeast. Within a mile or two of its source the West Canada creek rises and flows off southwest to the Mohawk, and the south branch of Moose river, another tributary of the Mohawk, via Black river, rises within a mile and a half of the Cedar. In 1885 I made a plant of 59,900 salmon in the Cedar where the stage road from North River to Blue Mountain Lake, crossed it, just beyond the

* In the reports this plant was credited to North River.

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village of Indian Lake. There was no logging on the stream that year and the fish could have a run of a dozen or more miles up the river.

Clendon brook flows into the Hudson about five miles above Glens Falls and is an excellent stream for salmon. I have already recommended this stream and, at a meeting of the American Fisheries Society, in Washington, have shown young salmon from it which were caught and sent by Mr. A. N. Cheney, who, I think, also sent some to Mr. E. G. Blackford. It is a good trout stream and is protected by its owners against public fishing. On the 23d of August, 1888, in company with Mr. Cheney, I visited the brook and we fished in it for about half a mile. In an open spot we took a few chubs and a few little trout, which we returned to the water. Following down the stream through a dense growth of alders we found a pool in which was a school of perhaps twenty fish, which Mr. Cheney said were salmon, and on casting his fly in it he took one which proved to be a salmon of seven inches in length. In another pool he took a second one, and by letting my fly drift down under the brush, leaving the rod back on the ground and holding the line in my hand, I brought one up where I could identify it before it broke loose. Mr. Cheney's fish were both returned to the stream. We then stopped. I had seen enough to assure me that the fish were there in numbers.

Clendon brook has received the following plants:

1884	41,000
1885*	59,700
1886	19,700
1888	50,000
Total	170,400

I can strongly recommend this brook for future plantings. It not only is a good stream for rearing the fry in, but is below several of the falls, especially the great one at Jessups Landing, which is a formidable one for a fish to go over, but which is dry in summer owing to the water being used in the great paper mill at that place. (See account of Palmer Falls, under the head of "Dams and Obstructions.")

When I began the work Professor Baird left the selection of streams to me, as I had a slight knowledge of the Adirondack region, but some of the brooks I did not know and depended on the opinions of the natives, judging that if they were good trout brooks they would do for salmon. I am, however, more indebted to Mr. Cheney

* And 150 yearlings.

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than to any other man, for this information, as well as of the dams and obstructions lower down, as he has fished that country very extensively and is one of our best-informed anglers. Stoddard's excellent map of the Adirondacks was also of use, but its scale does not permit the naming of the smaller brooks.

RECAPITULATION OF PLANTINGS SINCE 1882.

Carr's brook	342,600
Balm of Gilead brook	347,173
The Glen brook	89,000
North creek	135,650
Raymond brook	271,300
Gulf brook	55,000
Roblee brook	50,000
Minerva (including Kelso)	72,000
Beaver Meadow brook	39,000
Roaring brook	216,000
Clendon brook	170,400
Thirteenth brook	129,900
Indian river	36,200
Cedar river	59,900
Loon lake	38,600
Total	2,091,723

SALMON CAUGHT.

Up to 1888, when these investigations were made, it may be fair to consider only the three first plantings, which comprised 894,600 fry.

In 1886 several salmon were taken, one by John B. Denyse, in Gravesend bay, and three at the Troy dam, the weights ranging from ten pounds to fourteen and a half pounds. (See Rep. U. S. Fish Commission for 1885, foot note to p. 110.) It has been estimated that a dozen or more were taken in that year by the fishermen. Mr. Blackford bought the salmon caught by Denyse and displayed it on his stand, where it attracted great attention as a Hudson river salmon.

In 1887 many "North river salmon" were sold in New York, and were reported to have been taken up the river, although I know that some were taken in Gravesend bay. On November first of that year a spent male salmon was taken at Port Monmouth, New Jersey, and sent to Mr. Blackford. It was very poor and, while it measured two and a half feet in length, it weighed but seven pounds. The hook on the jaw was slight and the sides were blotched with red, as is usual with a ripe, or spent, male.

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This year, 1888, I have met with some difficulty in interviewing the shad fishermen, who are the ones who catch them, because of a law of New York which forbids their capture except with hook and line, and on interviewing a fisherman his first thought was that I was one of the State fish and game protectors or their agent, and he became suspicious. The conversation would run somewhat this way. After the usual references to the weather and other topical subjects, I would ask:

"Did you catch any salmon this season?"

"No-o; I didn't get one. That $100 fine for catching them is still good, ain't it?"

"Yes; that is the law, but [in a conciliatory tone] no man has been fined for it yet and it has not been enforced. I am the man who hatches and plants these fish in the river and I want to get evidence of the result of our work for the United States Fish Commission, in order to judge whether it will be advisable to continue it or not, and any information you give me will not be used to your detriment. If I publish any captures, as I may in my report, it will be so long in appearing that your grandchildren will be glad to know that you caught one of the first salmon placed in the river and the game protectors will be too old and infirm to interest themselves in your case. Besides this I will decline to testify against you and fail to recognize you in court, if you will only tell me what you know of catching salmon in the Hudson."

"Well, you talk square enough, but a man don't like to give his neighbors away, for while I didn't get a salmon some other fishermen did. Now if you won't give me away to them I'll tell you that——— of——— cotched two," etc., and in this way I have dug out a few catches. When I interviewed——— of——— he went over the same story, only he told me that the man I first talked with "got a big one."

The following is the full text of the law of the State on salmon, which, of course, does not affect the New Jersey fishermen, or those who fish from Bergen Point to below Piermont:

CHAPTER 530, LAWS OF NEW YORK.

AN ACT for the protection and preservation of salmon in the waters of this State.

PASSED June 6, 1887; three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. No person shall at any time kill or catch or attempt to kill or catch, salmon in the waters of this state with any device or in any manner, save that of angling with line or rod held in hand.

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§ 2. No person shall catch, or attempt to catch or kill, any salmon in said waters save only from the first of March to the fifteenth day of August in each year.

§ 3. Any person using nets in that part of the Hudson river within the jurisdiction of this State, in fishing for other fish allowed to be taken therein by nets, shall upon catching any salmon immediately return and restore the same to the water without injury. The foregoing provisions are not to apply to the operations of state or public hatcheries or to the artificial propagation of said fish by state or public authority.

§ 4. Any person violating any of the foregoing provisions of this act shall be deemed guilty of a misdemeanor, and, in addition, shall be liable to a penalty of one hundred dollars or one day's imprisonment for each dollar of fine; any informer to receive one-half of said fine. Actions for any violation of this act may be brought before any justice of the peace in any county which borders on the river or water opposite where the offense was committed, without regard to channel boundaries.

§ 5. All acts inconsistent with this act are hereby repealed.

§ 6. This act shall take effect immediately.

Gravesend bay.— The largest number of salmon taken by one man, that has come to my knowledge, was taken by John B. Denyse, of Unionville, Kings county, N. Y., who fishes in Gravesend bay, which is a portion of lower New York bay. He caught ten fish, averaging from nine to twelve pounds each, the largest weighing nineteen pounds. The fish were taken in fyke nets, set for shad, and were caught between May ninth and twenty-ninth. Eighteen more were taken in this bay, making twenty-eight in all. Mr. Donnelly took four; S. Voorhees, seven; Denyse and Cozine, three; while A. Voorhees, J. B. Voorhees, S. Morris and D. Snedicor took one each. Mr. John B. Denyse showed me a drawing of a young salmon, made by his son, of a fish caught by him on June 14, 1887, which was eight inches in length. The drawing was well done, and I had no doubt of its being a salmon.

New York bay.— There were twenty fish taken in the bay, weights not given. The following men took them: L. Kells, Greenville, N. J., three; H. Meserole, Greenville, N. J., four; J. Gelshion, Greenville, N. J., four; J. M. Minugh, Communipaw, N. J., two; J. Woods, Communipaw, N. J., one; J. McLaughlin, Jersey City, N. J., one; George Griffin, Pamrapo, N. J., two; Van Buskirk and Titus, Pamrapo, N. J., two; Richard Cadmus, Bayonne, N. J., one; total twenty.

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Princess bay.—Three fish are recorded from this water. D. Finnegan, Morris & Brown, and W. M. Morris, all of Port Monmouth, N. J., each took one.

New Jersey Shore of the Hudson.—Five salmon were taken just above Weehawken by as many men, or fishing partners. J. & J. Ludlow, S. & J. Ludlow, and R. Du Bois, all of Weehawken, each took one salmon, as did also Henry Scott, of Pleasant Valley, N. J., and Barber and Wilson, of Alpine, N. J.

From New York to Troy.—By favor of Mr. E. G. Blackford I obtained the addresses of the men who fish for shad in the Hudson and was thereby enabled to go directly to the fishermen, which greatly simplified the work in the different cities and villages by saving the time in making inquiries for them. Mr. Henry Burden, also one of the New York Fishery Commissioners, helped me to many facts concerning the catch about Troy and above. Mr. Burden has taken much interest in this matter and was instrumental in getting a McDonald fish-way put in the Troy dam by the State, mainly for the passage of salmon, which had been seen jumping at the dam and had been netted below it in former years. Mr. Matthew Kennedy, of the city of Hudson and one of the fish and game protectors of the State, as well as a shad fisherman owning several nets and employing a number of men in season, gave me valuable assistance in reporting such salmon captures as had come to his knowlege.

Matthew Kennedy says that eight salmon were taken at Hudson by two parties, and the fish were returned to the water alive. He saw the fish and his men caught some of them. His nets were old and tender and the salmon made holes in them, but if the nets had been stronger a great many more would have been taken. If the striped bass were as plenty about Hudson as they were a dozen years ago that fish would have been credited with making the holes, but the bass are scarce now, and he believes that salmon made them, for they were too small to have been made by sturgeon. Four of these fish were taken on one day in rough weather, and Mr. Kennedy thinks it worthy of note that all the others were taken when the water was rough. They were caught between the first and fourteenth of June. The water in the river was very high up to the middle of May and but little shad fishing was done until after that date.

Stockport.—John W. Best took four fish, weights not given, and at New Baltimore, H. Van Hoesen caught three which weighed forty pounds, or an average of over thirteen pounds each. At this point the channel is shallow and the nets are short, and salmon can escape them better than in most places.

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At the following places I learned of fish being taken. The towns are given as found on my note-book, without regard to their geographical sequence. In all cases it was not possible to learn the names of the captors, nor the weights of the fish, but where these items were learned they are given. Highland Falls, Mike McKiel, one; Mulls Fishery, Anthony Putnam, seine, two, eleven, eleven and one-half pounds; Catskill Point, seine, John Pindar, one, fifteen pounds; Cornwall, one, nine pounds; Barrytown, drift net, two, ten and three-quarters and thirteen pounds (several persons intimated that more were taken at this place, but were cautious about giving information for fear of being called on as witnesses); Kingston Point, drift net, two, ten, eight pounds; North Staatsburg, Millard Archer, two, ten, twelve pounds; Hyde Park, drift net, one; Elmore's Dock, drift net, two, ten and eighteen pounds; Newburgh, one; Verplanck's (Stony Point), three, twelve and three-quarters, eleven and one-half and fifteen and one-half.

Troy.— As before stated, Mr. Henry Burden kindly volunteered to get the needed information at this place, and his knowledge of men and locality enabled him to work the field better than a stranger could. I went out with him to a fisherman's floating house one day and found that the man in charge was very suspicious and if he or his friends had caught any salmon they were not going to expose themselves to a fine by telling it Mr. Burden writes me as follows:

224 THIRD STREET, TROY, *July* 30, 1888.

Mr. FRED MATHER:

DEAR SIR.— The catch of salmon in the vicinity of the Troy dam for the season of 1888 was twenty-six, varying in weight from five to twenty-six pounds. This number was known to have been taken, but the person who obtained the information thinks that more were caught.

Very truly.

HENRY BURDEN.

Of the salmon in the lower river *Forest and Stream* of May 17, 1888, said: "Up to Saturday last, fourteen salmon have been taken in the Hudson river between Communipaw and Yonkers. The largest one weighed ten and one-half pounds and the smallest eight pounds. They were taken by the shad fishermen in gill nets, and were, therefore, too badly injured to be returned to the water, as the law requires. The fisherman who took the fish at Yonkers did not know what it was, and on cutting it open found that it was red inside and threw it away as uneatable. The stocking of the river, begun by

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Professor Baird, is being continued by Colonel McDonald, and about 440,000 will be planted this spring from the Cold Spring Harbor hatchery. Over half of the fry have already been planted in the trout streams of Warren county, and the end of this week will find them all in the tributaries of the upper river. The experiment seems to be proving successful in spite of the doubters."

The *Troy Times* of May twenty-sixth, said: "This morning W. E. Hagan, of the Fish and Game Protective Association, reported to District Attorney Griffith that a salmon had been caught at the State dam in a net. The catch of salmon in this way is a violation of chapter 530, Laws of 1887. The penalty is $100 fine or thirty days imprisonment, at the option of the magistrate. A fine of twenty-five dollars is also to be imposed on any person having in his possession a salmon caught in a net. The salmon was in the possession of McGrath & Laflam, fish dealers at the Fulton market, Troy. They said they purchased the fish from William Askins, who caught it. The fish had been sold to a citizen, but when the latter was told that it would be a violation of law to receive it, he declined to accept the salmon. District Attorney Griffith sent Officer Forest after Askins, who said he did not know that he had violated any law. He was admonished to refrain from fishing for salmon with a net hereafter, and as this was the first case reported, it is not probable that Askins will be prosecuted. The same law prohibits fishing in the Hudson river on Sunday, and the agents of the Fish and Game Protective Association called on Supt. Willard and requested that the law be enforced within the city limits. The superintendent said he would direct the police to enforce the law. The salmon caught at the dam weighs twenty pounds."

Mechanicville.— Some fish went over the Troy dam in the June rise and got up as far as Mechanicville where the dam is high and impassable at the greatest floods known. Concerning this I have received the following letters:

GLENS FALLS, N. Y., *July* 24, 1888.

MR. FRED MATHER:

DEAR SIR.—Mr. A. C. Johnson of Mechanicville, N. Y., writes me that the salmon are below the dam at that place. He saw five at one time yesterday, and one was found dead last week which weighed twelve and a half pounds. He says that the boys want to shoot or spear them, but he does not mean that they shall. The water is low and the fish can not pass the dam. He says they are all big fish. There is a necessity for fishways in order to let the fish get to the breeding grounds, and the dams should be watched in order to keep

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the fish from being destroyed. The people should be instructed to let the breeding fish alone, in order that they may be benefited hereafter.

A. N. CHENEY.

There was a rumor that several salmon had been dynamited at Mechanicville, and the following letters relate to this:

TROY CLUB, *August* 18, 1888.

Mr. FRED MATHER:

DEAR SIR.—On my return home from Rochester I found a letter from Mr. A. N. Cheney, giving an account of the dynamite outrage at Mechanicville, and stating that he had written the Lake George game constable to go over there and investigate. I visited Mechanicville a few days ago with the builder of the Troy fishway, to look at the dam at that place. I saw Mr. A. C. Johnson, the person who reported about the dynamite to Mr. Cheney, and he said that no game constable had been there, and that it was now too late to fasten the crime on anyone, from the evidence on hand, although suspicion pointed strongly to two prominent citizens of the village. He said that three salmon, weighing from eight and one-half to twelve and one-half pounds were found dead floating about, the day after the dynamite was used.

Mr. Johnson also reported that a salmon was taken there recently on a trolling spoon. I never heard of such a case and can hardly believe it. Will investigate further and try and find out about it.

HENRY BURDEN.

TROY, N. Y., *November* 12, 1888.

MR. FRED MATHER:

The name of the man who took a salmon with a trolling spoon is John Conners. He is employed in the Fitchburg car shops at Mechanicville.

HENRY BURDEN.

Newburgh bay.—A newspaper slip, sent me by a correspondent, said that Mr. Eugene B. O'Sullivan, who lives at Fishkill Landing, caught a salmon weighing nine and one-half pounds with a fly, and sold it to Thomas Talbot, a fish dealer at the latter place. This was important, if true, and in conversation with State Game Protector Willett Kidd, I told him of it. Mr. Kidd kindly looked the matter up and found that the fish was taken in a shad net.

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RECAPITULATION OF CAPTURES.

Gravesend bay	28
New York bay	20
Princess bay	3
New Jersey shore	5
Hudson city	8
Stockport	4
New Baltimore	3
Highland Falls	1
Mulls	2
Catskill Point	1
Cornwall	1
Barrytown	2
Kingston Point	2
North Staatsburg	2
Hyde Park	1
Elmore's dock	2
Newburgh	1
Newburgh bay	1
Verplancks	3
Communipaw to Yonkers	14
Troy, below the dam	26
Mechanicville	4
Total known	134

I have no doubt that four times this number were taken by the shad fishermen who, as before stated, are very cautious about giving information, as before stated.

PROSPECTS FOR SPAWN GATHERING.

There are but two places where the fish have been taken in sufficient numbers to enable us to get some spawning fish. These are Troy and Gravesend bay. At Troy a number could be caught, or bought from the shad fishermen. At Gravesend bay they might be kept alive by the fishermen until the season was over, and then be purchased. The fishermen at this place did not know of any law on the subject, and openly sold their fish in the New York markets, receiving from twenty-five cents to one dollar per pound, the last figure being for the first two or three fish taken.

I do not think the water in the Hudson is cool enough to pen salmon in, below Troy. Between Troy and Mechanicville there are deep, cool, spots which I think would answer. Mr. Burden thinks

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that the trout ponds at Cold Spring harbor would be the best place to keep those captured in the lower river, until the spawning season, and in this I agree with him. At Mechanicville the fish would require watching night and day, but this might be done by watchmen at the mills, or an inclosure might be made in the tail-races of the mills where it would be difficult of access. I believe that some eggs might be taken next season, but experiment only would determine the number and the cost of obtaining them. If the operations were confined to the upper river a few might be obtained at Hudson, through Matthew Kennedy, and taken up in a fish car to add to the Troy catch. If the lower river was to be worked for fish to store at Cold Spring harbor, a small sailboat with a well in it would be needed.

POLLUTIONS OF THE RIVER.

In my opinion ordinary house, or water-closet, sewage does no harm to fish in a river. In proof of this I would call attention to the fact that shad have increased in the Hudson, through artificial culture, in spite of the growth of cities along its banks Chemical works pollute the water to some extent, but the injury depends entirely on the relative amounts of chemicals and water. A poisonous stream entering one side of a river does not mix, at once, with the whole stream, but continues down one shore and is finally precipitated and becomes harmless. The poisoned water would kill a fish entering it, but the instinct of the fish teaches it to avoid it. At times the muddy water of the Missouri river can be seen for many miles below its junction with the Mississippi, and this will serve to illustrate this point.

The paper mills formerly poured great quantities of chloride of lime in the river, and this substance was claimed, rightly or otherwise, to be the cause of the decrease of shad in the Connecticut river, some years ago, because of the paper mills at South Hadley Falls, Mass. There are paper mills on the Hudson from Troy up to Jessup's Landing, both numerous and large, but in all of them that I visited I was told that the use of chloride of lime had decreased to a mere fraction of what was formerly used. In these mills wood-pulp is the basis of paper and it does not require the bleaching that other materials do, and, as one manufacturer said: "We do not use as much chloride of lime in a month as we did in a day, before we began using wood-pulp, and you will find that this is the rule with all the paper mills." In conversation with other paper manufacturers they confirmed this statement, and therefore there is less than four per cent of poison from the paper mills than there was before wood-pulp was used to make paper.

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DAMS AND OBSTRUCTIONS.

The first obstruction that a salmon meets in the Hudson is the State dam at Troy, which barred their ascent until in June last, when a rise in the river gave two feet of water on the crest of the dam, and some salmon went over it. These are the fish referred to above, seen at Mechanicville. The State Legislature made an appropriation for a fishway in this dam, and one was built last summer, after the salmon run was over, by the McDonald Fishway Company. After the completion of this fishway I was in Troy, but the water was too high to see the structure, which I am informed is substantially built and is complete in all respects. This form of fishway differs in principle from all others and from a study of fishways in Europe and America I believe it to be the best in use. I have drawings of all different fish passes in the world, some of which have never been published, and some of them are very odd. When in charge of the department of American Fish-culture at the International Fisheries Exhibition, held at Berlin in 1880, I gathered a mass of material which was never published, because the Government did not issue a report of that exhibition, and among my sketches are some odd fishways in the English department. Allowing me to judge, I will say they were, some of them, of a most primitive sort, and of little use to most fishes. I merely cite this to show that I have paid attention to the construction of fishways and have a knowledge of the principles of all the different fishways, without professing to know anything about the practical building of one. From study of working models I am satisfied that the McDonald fishway is the easiest of ascent of any. I have seen a model of a catamaran actually go up one by the force of the side currents, while the water in the middle of the fishway was a turbulent rapid, gradually working down, but checked at every foot into a semblance of a mountain torrent.

I think, and so said in print, a dozen years ago, that fish will find the entrance to a fishway with greater certainty if it is at the foot of the dam, instead of below it, and would, therefore, advocate the building of a fishway above the dam, if possible to do so.

Mechanicville.— The dam at this place is nine miles above the Troy dam, and the water between them is a splendid series of salmon pools and rapids. It was at the foot of this dam that several salmon were seen jumping by a Mr. Greene, residing there, and where a twelve-pound salmon (not elsewhere reported) was found dead by George Baxter. The bed of the river here, as well as above and below, is a slate formation. The dam is fifteen feet high, built of stone laid in cement I looked the dam over, in company with Commissioner Henry Burden,

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and settled on a place where a fishway could be placed. Later, Mr. Burden, in company with Mr. Blaisdell, President of the McDonald Fishway Company, visited the dam and wrote me as follows:

TROY, N. Y., *August* 18, 1888.

MR. FRED MATHER:

We found a new place to locate a fishway in the Mechanicville dam, and that is alongside of the stone wall forming the canal from which the mill wheels take water. The gates at the head of this canal are always open, so that fish could get through to the river above. If there is no pollution in this canal I think a fishway could be built as cheap, if not cheaper than the one at Troy. It would be out of the way of ice, and would not cut into the main dam.

Sincerely yours.

HENRY BURDEN.

Stillwater.—This place, whose name awakes memories of the revolutionary war, has a dam made of logs, with an eight-foot perpendicular face, and it is three miles above Mechanicville, and fifteen miles below the Fort Miller dam. Although the dam is eight feet high on the west side of the river, it is not a foot high on the east side, and, before the dam at Mechanicville was built suckers and river herring (alewives) went over it in the spring. No fishway is needed here, because in ordinary seasons while fish are running they can pass this dam. Surely a salmon will have no trouble with an obstruction which a sucker can pass. A fishway at Mechanicville would give the salmon a clear run from Troy to the next dam, a distance of twenty-seven miles.

Thompson's Mill (*P. O.*).—At this place is the Saratoga State dam, two miles below the Fort Miller dam, and it is of stone, 824 feet long, nine and a half feet high, with an apron of ten feet. There are no falls here, only swift water, "rifts" below. In stages of high water there is moderately deep water below, which would serve as a resting place for salmon.

Fort Miller.—The dam here is a wing-dam, ten feet high at one end but only eighteen inches at the other. It is of wood, with a square face, and would not obstruct the passage of salmon. It is two miles above Thompson's Mill.

Fort Edward.—There is an old wooden dam here, made of log cribs, which will soon require to be rebuilt as it is much decayed. The dam is sixteen feet high. There are good pools just below it which have fourteen feet of water in them at low water. There is a "spillway" in the dam through which all the water goes when the river is

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low. This is for the passage of logs in summer. Below the dam is a great bed of sawdust, on the east bank.

Baker's Falls and Dam.—These falls are at Sandy Hill, a few miles below Glens Falls. It is said that before there were any dams on the river the shad came up as far as this, but could go no further. I heard this tradition from several persons but can not say more. The falls are slate rock and fall fifty-eight and a half feet in about 500 to 600 feet, the exact height being obtained from Allen Bros., paper manufacturers. The pool below, where the shad formerly stopped, is said to be seventy feet deep. Half way up the falls is a pool about 125 by 75 feet, and apparently fifteen deep. The dam on the top of the fall varies from three to eight feet in height.

Sandy Hill Dam.— This dam is about a half mile above the former and is of logs, eleven feet six inches high, with a spill-way in the middle, from which an incline runs down to low water, for the purpose of running logs.

Glens Falls and Dam.—The falls are hard, stratified rock, and at low water the descent from the crest of the dam is forty feet, in a distance of 150 feet. There are several steps and pools, in some of them the vertical distance is not over thirty feet. In the center it is higher and consequently the great body of water flows to each side. I saw it on August twenty-third and the river was then exceptionally low. It looked, at that time, to be practicable to make a passage for fish part of the way in the rock.

State Dam (at Feeder Dam).— This is one and three-quarter miles above Glens Falls. It feeds the Champlain canal and runs two saw-mills. Its height is thirteen feet and eleven inches, and is built of wood with an eighteen-foot apron. Water goes over this dam until July, when the brackets are put on and the water is all used by the canal and the mills. From this dam to Clendon brook, above, is five miles by river.

Palmer Falls and Dam.— These are at Jessup's Landing. The dam on the crest is twenty-five feet high, then rapids for a distance of a hundred feet, more or less, and a sloping fall of about fifty or sixty feet. It is eighty-five feet from the pool below to the foot of the dam. In dry times the enormous paper mill takes all the water in the river, but when I saw this fall, November twenty-second, it was a terrible place to think of going over, either for a salmon or a man. While building the dam in this wild mountain gorge two men went over the falls. One was killed and the other was so badly injured that he has never fully recovered. If the salmon planted above this fall go down safely they can go the rest of the way without injury. I confess to

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being doubtful about it and begin to think that possibly Clendon brook may have supplied a good share of the fish that have grown to maturity, for this fall surprised me with its violent rush through a narrow pass and its lack of a deep pool to receive the falling waters. I do not see how a living thing could escape being battered to death on the many exposed rocks, and especially at the foot of the dam, where there is a sheer fall of twenty-five feet and a shallow pool.

Rockwell's Falls.—These are at Luzerne, or Hadley. The village is on both sides of the river, in different counties, and has two names. This is the last obstruction on the river. The dam is fifteen feet high on the west bank, and runs to nothing on the east bank. A salmon could go over it with ease, if it could get here. The Sacandaga river enters the Hudson about two hundred yards below these falls.

CONCLUSION.

While I have expressed surprise that anything could live after passing Palmer Falls I do not wish to be understood as saying that it is impossible for it to do so. The varying current which would dash a man to pieces on the rocks may be safely run by a salmon going down tail first and keeping steerage way all the time by a vigorous up-stream motion, but if one simply looks at these formidable falls with the idea that a salmon would go down them as he or any other mammal would, he would shudder at the thought. The fact that all fishes go down stream in rapid water, tail first, when not hooked or frightened, must save them many a contusion which a cow would get. I have seen a trout go over a small dam, when of course, it did not know what might be below, and it would back down until its fear would cause it to resist the rapid current, and so would feel of it, always heading up stream, until at last it let the water have its way, in part only, and with head up stream and caudal fin in active motion, it was prepared to meet the wild rush of water with such muscular energy as it could muster. Taking this view of the case it is possible that young salmon may safely go down any impediment in the Hudson, but, if they go down at a low stage of water, when the whole river is turned into the wheels of the mills, "aye there's the rub," for in that rush of turbines what grinding comes when salmon have "jumped this bank and shoal," is more than we can say.

While holding fast to that which is good, and this means stocking the streams which have reared fish and sent them to sea in sufficient numbers to return again, I would suggest that the Sacandaga river be stocked. I know that its lower waters, especially below Mill creek,

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where the new hatchery of the New York Fish Commission is located, contain pickerel, *Esox lucius*, but so does the Hudson, from Albany up to above North creek. If the Sacandaga is to be stocked, I would say that the nearest way to reach its headwaters is via North River, six miles above North Creek, where the Adirondack railroad ends, and and thence by wagon to the "Drake Place," three miles east of Oregon, and make the plant in Diamond Mountain brook and in Siamese brook, and also in Buck Meadow brook, and Botheration pond. The latter is the head of the Sacandaga river. There is no need for me to write an essay on the benefits of planting salmon in the headwaters of streams where they get insect and crustacean food and escape their larger enemies.

I think that the tributaries of the Hoosick river, which enters the Hudson as low down as Stillwater, and other streams in Washington county, N. Y., might prove to be good rearing streams for salmon, but I have no personal knowledge of them. The same might be said of streams in the Catskills, of which I also know little beyond the fact that there are good trout streams there. If it is desirable to extend the number of streams to be stocked, or to substitute others for those which in my opinion are not as good as they should be, then some competent person should make an examination of other brooks.

I do not know what time of the year the young salmon go down past the obstructions named. If they go at low water, when at several places the great body of water goes through mill-wheels, many of them may be killed; hence my suggestion of stocking some streams lower down. If, however, the fish make the descent of the upper river at times of high water they have the choice of going over dams or through wheels. However this may be, some have escaped and the stocking of the Hudson with salmon is one of the successes of fish culture with which I feel proud to have been connected.

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REPORT OF COMMISSIONER SHERMAN

ON THE

Work Committed to his Charge, in Building the Mill Creek or Sacandaga Hatchery.

To the Board of Commissioners of Fisheries:

GENTLEMEN.—In pursuance of a resolution of the board adopted February 16, 1888, in the words following:

Resolved, That the work of building the hatchery at Mill creek pursuant to the act chapter 293, Laws of 1887, be committed to Commissioner Sherman, and that he be authorized to contract for the materials and work for the same, with some competent person or firm for a sum in gross, or if he be not able to have it done satisfactorily in that manner, that he be authorized to procure the requisite materials by purchase, and to employ competent mechanics and laborers to do the work under such inspection and supervision as he shall deem necessary, the expenditure to be kept within the appropriation now remaining unexpended; and that the treasurer of this commission pay, from time to time, on the requisition of the said commissioner, such sums of money as he shall need in the prosecution and completion of this work, to be accounted for by proper vouchers, and that so much of the former resolution of this board relating to the construction of this hatchery, as conflicts with this resolution, be and the same hereby is rescinded.

The undersigned reports that he has discharged the duty committed to him.

The location and construction of this hatchery had been by a previous resolution committed to Superintendent Seth Green, and under its authority Mr. Green had fixed the precise location at a point on Mill creek where this stream is crossed by the old State road leading from Lake Pleasant to the head of Jessup's river, and had there, in the autumn of 1887, constructed a dam, erected a temporary building for the accommodation of the necessary working force and had made some

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needed improvements to the main roadway; expending for these purposes the sum of $863.31. Superintendent Green had also advertised in the newspapers of Fulton and Montgomery counties for bids, pursuant to plans previously prepared, for the construction of the hatchery building, but none were offered; and it being then to late for economical out-of-door work, nothing more could be done in that season. The failing health of Mr. Green, resulting a few months later in his lamented death, rendered impracticable the resumption of the work in the spring of 1888; and in was accordingly, as per the resolution quoted above, put in my charge. On a careful review of the situation, it seemed to me that the interests of the State would be best promoted by the alternative means authorized by the resolution, of making purchases of the materials in the open market, and employing competent mechanics and laborers to do the work. Accordingly I secured the services of Mr. Sampson Evans, of Forestport, Oneida county, an experienced and skillful carpenter and builder, to take charge of the mechanical work and gave him authority to select such a force of competent assistants as he should need and to purchase the necessary materials. I also put upon the work, Mr. Thomas D. Williams, a competent accountant and a man of varied business experience, as inspector, entrusting to him the time and bookkeeping, the charge of the transportation needed and the purchase of subsistence supplies. This organization was continued throughout the work with the most satisfactory results, and the building now completed will, in its materials and workmanship, compare most favorably with any structure in the State, public or private, of similar cost. The appropriation has not only not been exceeded, but there remained after all construction expenses had been provided for, the sum of about $500 to apply to working outfit, furniture and other proper contingencies.

The resolution of the board, confirming the plans submitted by Superintendent Green, gave me authority to change them in any particular when I thought they might be improved. Pursuant to such authority I made several changes, adding somewhat to the cost, but commensurately more to the convenience and usefulness of the building. The principal change was the addition of an extension wing on the south side, of dimensions twenty-six feet by sixteen and two stories high, for the purpose of a woodshed in the first story and a workshop in the second. Another change was the extension in the length of the hatching troughs from ten to twelve feet, and the increase in the number to thirty-nine. The remaining changes were principally in the character of the lumber, all of which was directed to be first class.

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The building, as completed, is of ground dimensions forty-five by thirty-five feet, with a wing twenty-six by sixteen feet, giving a total floor area of about 2,000 square feet. The height of the main building is three stories, including the first pitch of the hip roof. The foundation rests upon solid granite rock, and is built of granite masonry from boulders split upon the spot, laid in mortar of the best Howe's cave cement and sharp, quartz sand drawn from the shores of Lake Pleasant. All the framing timbers are from straight-grained spruce logs cut on the premises, hewed or pit-sawed on the spot. Each joist is the half of a tree of not less than a foot in diameter, hewed on the upper and lower faces and lapping at the center supports four feet. This gives a strength and stability not often found in modern structures. The first covering on the frame is rough, spruce boards, over this, on roof as well as sides and ends, is a covering of waterproof felt paper. The roof is of shingles and the outer siding of first quality Michigan pine clapboards, well painted. The inner finish is, in the hatching-room, a ceiling on the sides and above, of clear spruce, put on diagonally. The second story is fitted up for dwelling apartments for the superintendent and his family and for the hands employed in the hatchery work. The walls here are all of plaster, hard-finished, in the best manner, and the casings are of handsomely wrought pine. All the inside work is hard-finished with suitable varnish on the native wood. The troughs are of native cherry similarly finished. The main stairway is of the same wood artistically wrought. It was found that the native cherry could be got out with the pit-saw for much less cost than pine of suitable quality could be procured from the lumber yards of the lower country, where only it could be got for use here.

The living rooms in the second story consist of a commodious kitchen, and separate sitting-room, four lodging-rooms of good size, each with a clothes-closet, and a pantry and store-room for provisions. The third story is available either for storage purposes or for beds as occasion may require.

The building used as a boarding-house during the progress of the work has been converted into a barn, for which it is well adapted.

Following will be found a classified statement, which will show the amount of expenditures under each branch of the work:

CLASSIFICATION OF THE FOREGOING STATED EXPENDITURES.

1. For lumber	$1,080 77
2. For other building material	365 96
3. For carpenter work	729 80

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4. For mason work	$186 60
5. For other labor	231 85
6. For transportation	435 06
7. For subsistence	503 31
8. For household furniture	86 36
9. For hatchery equipment	417 17
10. For miscellaneous and contingent	58 18
11. For on the road	41 63
	$4,136 69

The item of subsistence is for the board of the men employed during the construction of the work. There were no places within two miles where the men could be suitably boarded, and the loss of time which would occur from the daily travel of this distance, would much enhance the cost of the work. It was thus the obvious policy to board the men at the place where it was to be done. The building erected the preceding autumn under the direction of Mr. Green was suitable for this purpose and was used accordingly. The men were comfortably quartered and were furnished with food of good quality and ample quantity and variety, for a cost not exceeding three dollars and fifty cents per week for each person, which is much less than not as good board would have cost elsewhere.

Among the items of expenditure is one for repairs to the State road. This does not include all that might be properly charged to that service, as the hands employed in construction sometimes helped in the road work, and the distinction in the expense can not be accurately made. This work was absolutely necessary as the road had been for years practically abandoned by the local authorities, and was not only dilapidated but unsafe, as the undersigned can testify from his own experience, having been twice thrown out of a buck-board wagon, without contributory negligence of his own, while passing over it in the service of the State. It has been made, however, by the moderate expenditure put upon it, as good as any road in the township, and better than the most of them.

Among the articles of working outfit paid for out of the surplus of appropriation, are the following: One young and excellent work-horse, with wagon and harness; a champion sawing machine, a chain hoist of three tons capacity, a fair outfit of working tools, a good cook stove with necessary utensils, a sufficient set of table ware and a good supply of bedding.

As a precaution against loss by fire, two extinguishers of the most approved kind have been provided for this hatchery, and in view of

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the possibility of destruction at a time when the Legislature may not be in session to make an appropriation for rebuilding, policies of insurance have been taken for $3,000 on the hatchery and contents.

In closing this report it is apropos to refer to the situation of this hatchery with reference to the purpose for which it has been built.

For its uses the State has set apart and appropriated 2,590 acres of land, embracing the following lots, in township two, Totten & Crossfield's purchase in the town of Lake Pleasant, Hamilton county, viz.: Part of lot 32, and whole lots Nos. 29, 33, 40, 44, 51, 53, 55, 66 and 67. This gives a strip on the east side of township two, commencing one-half mile south of the hatchery and extending northerly, of a width of one-half mile to a mile, a distance of seven miles or more to and across Jessup's river. There are also in the reservation several lots detached from this strip and lying westward of it. On all this territory, by a special act of the Legislature (chapter 445, Laws of 1888), no trespass is to be committed on timber and no person, without the consent of the Commissioners of Fisheries, for legitimate hatchery uses, may fish or enter for the purpose of fishing, under the penalty of fifty dollars for each offense.

The stream on which the hatchery is situated is a remote tributary of the upper Hudson or North river. Though small, it is a natural and inexhaustible trout brook, having stood almost daily fishing throughout the open season for fifty or more years, but owing to its natural facilities, still fairly holding its own. It is made up of numerous pure and cold springs. Its bed is alternate rock and gravel. Where the hatchery is situated it is solid granite rock, over which the water comes tumbling in miniature falls. Two hundred feet up the stream from the hatchery is a gap in the rocks six feet wide and four feet deep. Here, resting on the firm rock on each side, has been constructed a timber dam four feet high. From the small pond thus created, water is conveyed through a six-inch wrought iron tube to a bulkhead in the hatchery whence it is conveyed by similar tubes to the distributing troughs on each side. The fall in this 200 feet is twenty feet, so that the water at the surface of the dam is on a level with the center of the windows in the second story. The supply is excellent and abundant. Eventually it will be good policy to substitute for the timber dam, solid masonry, of which it will not require more than ten cubic yards to fill the gap, and to raise the dam by similar masonry two feet from its present level. This will greatly extend the area of the pond above and make it available for a large supply of stock or breeding fish. Below the hatchery, for three miles, the stream flows over alternate broken rock and gravel, through an

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almost inaccessible alder swamp, affording the best kind of shelter and abundant insect food for millions of fish fry; which after attaining a year's growth will work into Round lake, into which Mill creek flows, and will thus in the most natural manner restock that and the larger Lake Pleasant below.

The country about Lake Pleasant has been long settled and presents an open area, from which a vista is given of extensive mountain ranges, diversified by alternate peaks and valleys, and all heavily wooded. No more beautiful view is to be seen anywhere in the Adirondack wilderness. Within a radius of twenty miles from the hatchery, are not less than twenty important lakes, and many smaller trout waters. The famed Cedar and Canada lakes, four in number, lying at attitudes of 2,000 or 2,500 feet above tide water, are on the outer verge of this radius. There is yet fair fishing in all these waters, but it can not be long continued without artificial replenishment, such as this hatchery is designed to give.

It is to be hoped that the efforts of the commissioners to this end will find hearty support from the hotelkeepers, guides, tourists, and sportsmen who derive pleasure and maintenance from the native resourses of this interesting region, and from the people of Hamilton county generally, and receive favorable consideration from the Legislature.

RICHARD U. SHERMAN.

NEW HARTFORD, *December* 1, 1888.

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MILL CREEK OR SACANDAGA HATCHERY.

Expenditures for construction, pursuant to chapter 293, *Laws of* 1887.

Amount of appropriation remaining unexpended December 1, 1887, $4,136.69.

Number of voucher.	TO WHOM PAID.	For what purpose paid.	Amount.
1	Sampson Evans.....	Travel to hatchery site and return.....	$10 00
2	Sayre & Randell....	Hardware for hatchery build'g	16 94
3	S. F. Sherman.....	Blankets, sheets, etc.....	49 25
4	E. W. Morris.....	Work harness, blankets, etc..	39 30
5	Durrenbeck & Collins	Lumber wagon.....	75 00
6	P. Studor.....	Work horse..	160 00
7	Sayre & Randell....	Hardware and tools.....	14 96
8	H. Lux & Son.....	Provisions	24 91
9	D. Aird & Son.....	Lumber	140 12
10	W. W. Burnham....	Groceries and building supplies	96 87
11	Bion Page.....	Shingles	6 75
12	Addison McIntyre..	Transportation	8 80
13	S. Evans.....	Work as boss carpenter....	60 00
14	Owen Jones.....	Work as carpenter.....	16 00
15	Charles Letson.....	Blacksmith work	6 75
16	Wm. Davidson.....	Carpenter work	10 13
17	Harry Spinning.....	Labor	33 08
18	George Fister.....	Labor	23 30
19	James Keenan.....	Mason work.....	40 00
20	N. R. Page.....	Labor and supplies	14 00
21	James Keenan.....	Blasting rock.....	14 13
22	Addison McIntyre ..	Transportation.....	6 00
23	Owen Jones	Carpenter work	44 20
24	George Abbott	Carpenter work	36 60
25	W. Davidson	Labor	12 38
26	George Fister	Labor	10 40
27	S. Evans.....	Work as boss carpenter	50 00
28	R. U. Sherman	Travel and expenses on tour of inspection.....	37 00
29	E. Dunning.....	Groceries, b'ld'g material, etc	110 48
30	H. N. Scidmore	Clock	4 75
31	George Rice	Transportation of lumber....	15 00
32	Judd Straight.....	Transportation of lumber ...	9 60
33	W. W. Burnham....	Provisions and b'ld'g. supplies	68 30
34	S. Hosley	Hotel accommodation.....	6 75
35	H. R. Page	Shingles	8 38
36	H. E. Slack	Shingles.....	6 75
37	W. A. Brown	Butter.....	6 37
38	D. Aird & Son.....	Lumber	220 21

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MILL CREEK OR SACANDAGA HATCHERY — (*Continued*).

Number of voucher.	TO WHOM PAID.	For what purpose paid.	Amount.
39	Green, Mosher & Co.	Lumber	$815 25
40	B. Wilson & Co	Building paper	45 00
41	N. H. Canning Co. (Limited)	Canned goods, water lime, etc	90 18
42	Seneca Falls M'fg Co	Paragon rip-saw	50 00
43	Daniel Cochran	Transportation	24 80
44	E. S. Morrison	Fresh meat	11 74
45	Calvin Wilber	Fresh meat	15 38
46	N. R. Page	Labor and supplies	31 05
47	W. H. Grinnell	Transportation	63 18
48	W. J. Williams	Plastering	41 00
49	W. J. Williams	Plastering	51 90
50	W. H. Clark, Agent	Chain hoist	35 00
51	Fonda, Johnstown & Gloversv. R. R. Co.	Transportation	50 32
52	S. Evans	Boss carpenter	68 50
53	Owen Jones	Carpenter work	54 50
54	George Abbott	Carpenter work	41 40
55	W. Davidson	Labor	32 19
56	George Fister	Labor	26 20
57	William Davidson	Labor	1 87
58	George Fister	Labor	1 50
59	Owen Jones	Carpenter work	82 58
60	George Abbott	Carpenter work	53 63
61	F. T. Ray	Paint and oil	70 41
62	E. Dunning	Groceries	36 33
63	Anna C. Evans	Housework	63 00
64	S. Evans	Boss carpenter	15 00
65	George Fister	Labor	48 25
66	W. Davidson	Labor	9 88
67	William Davidson	Labor	21 94
68	William Davidson	Labor	28 13
69	Smith & Jones	Paint	35 00
70	A. L. Henry	Brick	15 00
71	S. Hosley	Hotel accommodation	19 00
72	W. W. Burnham	Groceries, etc	72 78
73	G. N. Brown	Lime, etc	35 73
74	N. R. Page	Milk and washing	32 20
75	Green, Mosher & Co.	Lumber	90 18
76	Harry Spinning	Labor	47 85
77	S. Evans	Lumber	320 88
78	S. Evans	Transportation	32 85
79	S. Evans	Work as boss carpenter	19 50
80	Seth Green	Disbursements	8 43
81	Wilson & Taylor	Hardware	9 22
82	L. C. Childs & Son	Printing	5 00

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MILL CREEK OR SACANDAGA HATCHERY — (*Continued*).

Number of voucher.	TO WHOM PAID.	For what purpose paid.	Amount.
83	Fitch Byce	Potatoes, etc	$7 25
84	W. B. Abrams	Blacksmith work	8 70
85	G. Winney	Hotel accommodations	39 50
86	W. G. Page	Fresh meat	10 23
87	Benjamin Sack	Provisions	5 97
88	George Danforth	Labor, etc	22 26
89	O. Dunning	Fresh meat, etc	15 98
90	Edgar Morrison	Fresh meat, etc	11 41
91	Bion Page	Provisions	4 88
92	David Satterlee	Provisions	5 29
93	Wilson & Taylor	Hardware	3 49
94	A. Bowman	Transportation	14 88
95	Henry Page	Fresh meat	5 50
96	David Sturges	Hotel accommodation	22 40
97	T. D. Williams	Disbursements	34 00
98	T. D. Williams	Disbursements	26 62
99	T. D. Williams	Disbursements	9 78
100	T. D. Williams	Services as inspector	157 50
101	H. Lux & Son	Pork and lard	11 33
102	R. U. Sherman	Disbursements	8 53
	Total		$4,162 69
	Deduct for amount refunded by Green, Mosher & Co., Fort Hunter, for freight on lumber furnished by them as per voucher 39, abstract C, and 75 abstract D, and by agreement, deliverable at Northville		26 00
			$4,136 69

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ENGINEER'S REPORT.

To the Commissioners of Fisheries, State of New York:

GENTLEMEN.— I have the honor to submit the following account of my work for the year ending November 30, 1888:

At the time of writing my last report I had on hand all the field notes of the summer of 1887.

They included the establishment of a large number of triangulation points on the northern side of Long Island, from just above Hell Gate to the end of Long Island sound, a distance of 100 miles; the investigation of several natural-growth oyster beds, and of the character of the vast areas of ground lying under the salt waters of the State; together with a great many miscellaneous subjects pertaining to the shell-fish branch of the Fish Commission.

Besides these was the grand scheme of dividing Long Island sound into a system of townships, which would contain a certain number of acres each, have boundaries, whose bearings would be upon cardinal points of the compass, and which would not be deflected by the curvature of the earth during their expansion over some ninety miles.

In addition, still, were several hundred applications for lands to be examined (many of which were for from five to ten separate lots), deeds to be made out, mathematical descriptions of lots to be produced for lands already granted, with their areas to be computed, etc.

Then again all these data had to be duplicated and checked for record so that they could be deposited in two different places as a safeguard against fire and other accident.

The reports upon disputed ground were also matters requiring careful attention and considerable study.

All of these things were considered in their order during the winter, and were presented to you in the manner with which you are familiar, so I will only dwell upon a few of the details connected with them.

In making the projections of Long Island sound I used the Clarke spheroid of 1866, and the astronomical data of the federal government of 1881. In most cases the scale used was 1:1000, upon which the original sheets of the coast survey topography were made. I have

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obtained recently, from the office in Washington, tracings of these original sheets, and have already transferred much of that work to our own projections.

All of our linear measurements have been made upon the metric system, which, though a little uncommon, has such undoubted advantages that it would be a great disregard of progress did we not adopt it. Upon our projections the length of one metre is easily discernible. All our work was done upon the finest antiquarian paper, well backed with cloth and seasoned.

Each projection is kept in a separate tin can and protected from excessive changes of temperature or humidity of the atmosphere.

In compiling our books of descriptions of signals greater pains were taken than with those in Raritan bay, about which I had felt some pride. We had three special volumes made, containing some 900 numbered pages, with unusually strong bindings. Each book had an alphabetical index, and each index had the complete list for all three books. Book one contained the first third (alphabetically), and so on. Several pages were left at the end of each set of signals beginning with a certain letter, so that there will always be room for new signals without breaking the continuity of the system, and the index of any book will show upon which page of which book any particular name may be found. Whenever practicable an elaborate sketch was added to the written description.

These descriptions include in all over 200 well established points which we are keeping in repair. The signals we have built vary in size from twelve to forty feet in height requiring from an hour and a half to a day and a half in construction. These descriptions were also duplicated in a less elaborate form.

Altogether I feel well satisfied that our system is about as thorough as it can well be made, and that the possibilities of error have been reduced to a minimum.

To illustrate this I will give the steps gone through from the time the occupant of a lot puts in his application to the time he gets his franchise.

(1.) Examining application.

(2.) Filing brief description of same.

(3.) Making appointment with applicant to show position of the lot applied for.

(4.) Surveying the lot.

(5.) Mapping the lot.

(6.) Adjusting conflicting claim, if any.

(7.) Determining area.

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(8.) Making report as to whether the granting of the franchise will give the owner more property, together with what he has, than allowed by law.

(9.) Conferring with shell-fish commissioner as to whether the land includes any natural-growth oyster ground or not.

After which the application is ready to be passed upon by the full board.

If granted,

(10.) Making entries of same in the records.

(11.) Making out a mathematical description of every corner of the lot with reference to certain fixed geographical points.

(12.) Checking same.

(13.) Entering the same in the "description of corners" book.

(14.) Checking same.

(15.) Making out franchises.

(16.) Checking same.

(17.) Copying franchises in "deed book."

(18.) Checking same.

(19.) Copying survey records.

(20.) Checking same.

(21.) Making note of amount of land granted to each applicant under his separate name, as it occurs, in order to be able to keep track of the amount of his property.

During the year I have made out franchises for 8143.6 acres of land, which were granted to different individuals in areas ranging from one-half an acre to 250 acres.

My attention was called so repeatedly to the question of the boundary line upon the water between the States of New York and Connecticut that, under the direction of the Shell Fish Commissioner, I have made all the efforts within my power to bring the subject to a satisfactory conclusion. So far the obstacles have been so great that I am led to believe it will require joint legislative action between the two States to settle the meaning of the wording of the report of the boundary commission.

For instance, the agreement between the commissioners reads: Commencing at a point 0, etc., which is "about" such and such a distance from a certain rock and running thence, etc.

There is no mathematical data given, and the point 0 is simply a mark upon two charts on paper, subject to considerable and unequal shrinkage.

I wrote to the State Engineer to ask him for his official interpretation of the geographical position of the beginning of the line. But

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he did not feel authorized to constitute himself a judge or court and declined to give it.

After that I consulted with the authorities in Washington to find out if they had any additional data. Although the agreement of the boundary commissioners had been ratified by Congress, there was nothing more explicit to be had from the capital.

Through the kindness of Mr. B. A. Colonna, assistant in charge of the coast survey office, I was furnished with elaborate tracings of the most recent topographical and hydrographic field-work of the immediate vicinity of the starting point, upon a large scale.

With this as a basis I wrote to the engineer of the Connecticut fishery commission to see if we could not formulate some plan by which the commissioners of both States might come to an understanding and act accordingly. But after a long and careful correspondence it was found to be impracticable.

So the subject is still an open one and can readily be the source of dispute and dissension between the citizens of the two States.

Time and time again during the past summer I was asked to designate certain portions of the line, but did not feel at liberty to do so. Men have come miles to find out in which State certain lands lie.

At one time a well stocked natural bed was discovered. It was near the borders. The citizens of both States were in doubt whether it was their right to work it and derive benefit from it, or whether, by so doing, they would be subject to fine and imprisonment.

A small fleet of vessels sailed down to me to make inquiry while others took their chances and went to work. Some of the latter had their vessels seized and were arrested, held and fined.

It is unnecessary for me to mention additional instances, for the result is nearly always the same.

The line can be more readily adjusted now than at any other time in the future, for as the interests involved become greater the complications are increased in like proportion.

I would strongly recommend that joint legislation be invoked at an early date which will lead to a speedy and amicable solution of the problem.

Such advantages have grown from the system of division of uplands into rectangular townships, sections, etc.; that the advisability of adopting a similar method for lands under water can not be questioned.

In our system a township contains 1,000 acres, and is divided into 100 lots of ten acres each. Of course the decimals are preferable, but since the amount of the land to be owned by any one citizen is

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limited by law to 250 acres, we have also divided these townships into four "sections."

The lots are numbered from one to 100, commencing with the north-west lot and reading from west to east. The sections are lettered A, B, C and D. A is the north-east, B the south-east, and so on with the hands of a watch.

As the isogonic curves are changing constantly, and as the magnetic variation for a given place has not only a rate but sometimes an acceleration, it would require that continual corrections be applied from year to year to the magnetic bearings of lines in order to reduce them to the bearings of some fixed date.

Hence we have used the true bearings in all our lines instead of the magnetic.

Moreover, for the boundaries of these townships we have used cardinal points of the compass, so that the northern and southern boundaries are true east and west lines, etc.

Were the waters of Long Island sound within small limits there would be no difficulty in laying out these townships, for they could be made practically square.

But, as the chain extends over ninety miles, the curvature of the earth must play an important part in all calculations concerning them. For instance, if we made the figures square, and started at the western end of the sound with cardinal points, by the time we reached the eastern limit these lines would by no means run east and west or north and south.

The variation in azimuth would be considerable. So, since the townships can not be made square, they must be made from acres of great and small circles and vary in shape. No township in a given latitude could have the same dimensions as one in another. Each has to be distorted, so to speak, and each distorted according to a formula different for different latitudes.

Though they are not square, they are nearly so. Those to the northward of parallel forty-one degrees are a little narrower and those to the southward a little flatter.

In the computations the accumulated error in ninety miles was one metre, and this maximum was at a point where the current is so strong and the water so deep that a buoy would swing through at least twenty-five metres. So the degree of refinement of the calculations is certainly far within the practical requirements.

The system starts at the meridian of seventy-three degrees fifty minutes west of Greenwich and goes eastward.

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The southwesterly township is No. 101, the next to the eastward is 102, and so on. The next to the northward is 201, and its neighbor on the east is 202, and so on.

By using a system of abscissa and ordinates the buoy number of any corner is easily given by adding two digits. Thus, lot No. 1, of township 333, would be bounded by corners as follows :

North-east, No. 33301; south-east, No. 33311; south-west, No. 33310, and north-west, No. 33300.

Latitude forty-one degrees is the boundary line between the ninth and tenth line of townships counting from the south.

The following table shows the position of townships.

GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS INTO WHICH LONG ISLAND SOUND, NEW YORK, HAS BEEN DIVIDED FOR SHELL FISH CULTIVATION UNDER THE DIRECTION OF EUGENE G. BLACKFORD, SHELL FISH COMMISSIONER.

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
103	North-east	40	51	586.0	73	45	978.5
	South-east	40	50	430.5	73	45	979.0
	South-west	40	50	430.5	73	47	184.0
	North-west	40	51	586.0	73	47	184.0
104	North-east	40	51	586.0	73	44	368.0
	South-east	40	50	430.5	73	44	368.0
	South-west	40	50	430.5	73	45	979.0
	North-west	40	51	586.0	73	45	978.5
203	North-east	40	52	742.5	73	45	978.0
	South-east	40	51	586.0	73	45	978.5
	South-west	40	51	586.0	73	47	184.0
	North-west	40	52	742.5	73	47	184.0
204	North-east	40	52	742.5	73	44	368.0
	South-east	40	51	586.0	73	44	368.0
	South-west	40	51	586.0	73	45	978.5
	North-west	40	52	742 5	73	45	978.0
205	North-east	40	52	742.5	73	42	1,162.5
	South-east	40	51	586.0	73	42	1,162.5
	South-west	40	51	586.0	73	44	368.0
	North-west	40	52	742.5	73	44	368.0
206	North-east	40	52	742.5	73	41	552.0
	South-east	40	51	586.0	73	41	552.0
	South-west	40	51	586.0	73	42	1,162.5
	North-west	40	52	742.5	73	42	1,162.5
207	North-east	40	52	742.5	73	39	1,346.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	52	742.5	73	41	552.0
303	North-east	40	53	899.0	73	45	978.0
	South-east	40	52	742.5	73	45	978.0
	South-west	40	52	742.5	73	47	184.0
	North-west	....	....	.....	....	....	.....

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC. — (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
304	North-east	40	53	899.0	73	44	368.0
	South-east	40	52	742.5	73	44	368.0
	South-west	40	52	742.5	73	45	978.0
	North-west	40	53	899.0	73	46	978.0
305	North-east	40	53	899.0	73	42	1,162.0
	South-east	40	52	742.5	73	42	1,162.5
	South-west	40	52	742.5	73	44	368.0
	North-west	40	53	899.0	73	44	368.0
306	North-east	40	53	899.0	73	41	551.5
	South-east	40	52	742.5	73	41	552.0
	South-west	40	52	742.5	73	42	1,162.5
	North-west	40	53	899.0	73	42	1,162.0
307	North-east	40	53	899.0	73	39	1,346.0
	South-east	40	52	742.5	73	39	1,346.0
	South-west	40	52	742.5	73	41	552.0
	North-west	40	53	899.0	73	41	551.5
308	North-east	....	....	.....	....	....	.....
	South-east	....	....	.....	....	....	.....
	South-west	40	52	742.5	73	39	1,346.0
	North-west	40	53	899.0	73	39	1,346.0
404	North-east	40	54	1,056.5	73	44	367.5
	South-east	40	53	899.0	73	44	368.0
	South-west	40	53	899.0	73	45	978.0
	North-west	40	54	1,056.5	73	45	978.0
405	North-east	40	54	1,056.5	73	42	1,161.5
	South-east	40	53	899.0	73	42	1,162.0
	South-west	40	53	899.0	73	44	368.0
	North-west	40	54	1,056.5	73	44	367.5
406	North-east	40	54	1,056.5	73	41	551.5
	South-east	40	53	899.0	73	41	551.5
	South-west	40	53	899.0	73	42	1,162.0
	North-west	40	54	1,056.5	73	42	1,161.5
407	North-east	40	54	1,056.5	73	39	1,345.5
	South-east	40	53	899.0	73	39	1,346.0
	South-west	40	53	899.0	73	41	551.5
	North-west	40	54	1,056.5	73	41	551.5
408	North-east	40	54	1,056.5	73	38	735.5
	South-east	40	53	899.0	73	38	735.5
	South-west	40	53	899.0	73	39	1,346.0
	North-west	40	54	1,056.5	73	39	1,345.5
409	North-east	40	54	1,056.5	73	37	125.0
	South-east	....	....	.....	....	....	.....
	South-west	40	53	898.0	73	38	735.5
	North-west	40	54	1,056.5	73	38	735.5
505	North-east	40	55	1,214.5	73	42	1,161.5
	South-east	40	54	1,056.5	73	42	1,161.5
	South-west	40	54	1,056.5	73	44	367.5
	North-west	....	....	.....	....	....	.....
506	North-east	40	55	1,214.5	73	41	551.5
	South-east	40	54	1,056.5	73	41	551.5
	South-west	40	54	1,056.5	73	42	1,161.5
	North-west	40	55	1,214.5	73	42	1,161.5
507	North-east	40	55	1,214.5	73	39	1,345.0
	South-east	40	54	1,056.5	73	39	1,345.5
	South-west	40	54	1,056.5	73	41	551.5
	North-west	40	55	1,214.5	73	41	551.5

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC. — (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
508	North-east	40	55	1,214.5	73	38	735.0
	South-east	40	54	1,056.5	73	38	735.5
	South-west	40	54	1,056.5	73	39	1,345.5
	North-west	40	55	1,214.5	73	39	1,345.0
509	North-east	40	55	1,214.5	73	37	125.0
	South-east	40	54	1,056.5	73	37	125.0
	South-west	40	54	1,056.5	73	38	735.5
	North-west	40	55	1,214.5	73	38	735.0
510	North-east	40	55	1,214.5	73	35	919.0
	South-east	40	54	1,056.5	73	35	919.5
	South-west	40	54	1,056.5	73	37	125.0
	North-west	40	55	1,214.5	73	37	125.0
511	North-east	40	55	1,214.5	73	34	309.0
	South-east	....	....	.....	....	....	.....
	South-west	40	54	1,056.5	73	35	919.5
	North-west	40	55	1,214.5	73	35	919.0
606	North-east	40	56	1,372.5	73	41	551.0
	South-east	40	55	1,214.5	73	41	551.5
	South-west	40	55	1,214.5	73	42	1,161.5
	North-west	....	....	.....	....	....	.....
607	North-east	40	56	1,372.5	73	39	1,345.0
	South-east	40	55	1,214.5	73	39	1,345.0
	South-west	40	55	1,214.5	73	41	551.5
	North-west	40	56	1,372.5	73	41	551.0
608	North-east	40	56	1,372.5	73	38	735.0
	South-east	40	55	1,214.5	73	38	735.0
	South-west	40	55	1,214.5	73	39	1,345.0
	North-west	40	56	1,372.5	73	39	1,345.0
609	North-east	40	56	1,372.5	73	37	125.0
	South-east	40	55	1,214.5	73	37	125.0
	South-west	40	55	1,114.5	73	38	735.0
	North-west	40	56	1,372.5	73	38	735.0
610	North-east	40	56	1,372.5	73	35	918.5
	South-east	40	55	1,214.5	73	35	919.0
	South-west	40	55	1,214.5	73	37	125.0
	North-west	40	56	1,372.5	73	37	125.0
611	North-east	40	56	1,372.5	73	34	309.0
	South-east	40	55	1,214.5	73	34	309.0
	South-west	40	55	1,214.5	73	35	919.0
	North-west	40	56	1,372.5	73	35	918.5
612	North-east	40	56	1,372.5	73	32	1,102.5
	South-east	40	55	1,214.5	73	32	1,103.0
	South-west	40	55	1,214.5	73	34	309.0
	North-west	40	56	1,372.5	73	34	309.0
613	North-east	40	56	1,372.5	73	31	492.5
	South-east	40	55	1,214.5	73	31	493.0
	South-west	40	55	1,214.5	73	32	1,103.0
	North-west	40	56	1,372.5	73	32	1,102.5
614	North-east	40	56	1,372.5	73	29	1,286.0
	South-east	40	55	1,214.5	73	29	1,286.5
	South-west	40	55	1,214.5	73	31	493.0
	North-west	40	56	1,372.5	73	31	492.5
615	North-east	40	56	1,372.5	73	28	676.2
	South-east	....	....	.....	....	....	.....
	South-west	40	55	1,214.5	73	29	1,286.5
	North-west	40	56	1,372.5	73	29	1,286.0

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.— (*Continued*).

wnship.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
707	North-east	40	57	1,531.5	73	39	1,344.5
	South-east	40	56	1,372.5	73	39	1,345.0
	South-west	40	56	1,372.5	73	41	551.0
	North-west	....	....	.....	....	....	.....
708	North-east	40	57	1,531.5	73	38	734.5
	South-east	40	56	1,372.5	73	38	735.0
	South-west	40	56	1,372.5	73	39	1,345.0
	North-west	40	57	1,521.5	73	39	1,344.5
709	North-east	....	....	.....	....	....	.....
	South-east	40	56	1,372.5	73	37	125.0
	South-west	40	56	1,372.5	73	38	735.0
	North-west	40	57	1,531.5	73	38	734.5
710	North-east	....	....	.....	....	....	.....
	South-east	40	56	1,372.5	73	35	918.5
	South-west	40	56	1.372.5	73	37	125.0
	North-west	....	....	.....	....	....	.....
711	North-east	....	....	.....	....	....	.....
	South-east	40	56	1,372.5	73	34	309.0
	South-west	40	56	1,372.5	73	35	918.5
	North-west	....	....	.....	....	....	.....
712	North-east	40	57	1,531.5	73	32	1,102.0
	South-east	40	56	1,372.5	73	32	1,102.5
	South-west	40	56	1,372.5	73	34	309.0
	North-west	....	....	.....	....	....	.....
713	North-east	40	57	1,531.5	73	31	492.5
	South-east	40	56	1,372.5	73	31	492.5
	South-west	40	56	1,372.5	73	32	1,102.5
	North-west	40	57	1,531.5	73	32	1,102.0
714	North-east	40	57	1,531.5	73	29	1,285.5
	South-east	40	56	1,372.5	73	29	1,286.0
	South-west	40	56	1,372.5	73	31	492.5
	North-west	40	57	1,531.5	73	31	492.5
715	North-east	40	57	1,531.5	73	28	676.0
	South-east	40	56	1,372.5	73	28	676.5
	South-west	40	56	1,372.5	73	29	1,286.0
	North-west	40	57	1,531.5	73	29	1,285.5
716	North-east	40	57	1,531.5	73	27	66.5
	South-east	40	56	1,372.5	73	27	66.5
	South-west	40	56	1,372.5	73	28	676.5
	North-west	40	57	1,531.5	73	28	676.0
717	North-east	40	57	1,531.5	73	25	860.0
	South-east	40	56	1,372.5	73	25	860.0
	South-west	40	56	1,372.5	73	27	66.5
	North-west	40	57	1,532.5	73	27	66.5
718	North-east	40	57	1,531.5	73	24	250.0
	South-east	40	56	1,372.5	73	24	250.5
	South-west	40	56	1,372.5	73	25	860.0
	North-west	40	57	1,531.5	73	25	860.0
719	North-east	40	57	1,531.5	73	22	1,043.5
	South-east	40	56	1,372.5	73	22	1,044.0
	South-west	40	56	1,372.5	73	24	250.5
	North-west	40	57	1,531.5	73	24	250.0
720	North-east	40	57	1,531.5	73	21	433.5
	South-east	40	56	1,372.5	73	21	434.0
	South-west	40	56	1,372.5	73	22	1,044.0
	North-west	40	57	1,531.5	73	22	1,043.5

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC. — (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
721	North-east	40	57	1,531.5	73	19	1,227.0
	South-east	40	56	1,372.5	73	19	1,227.5
	South-west	40	56	1,372.5	73	21	434.0
	North-west	40	57	1,531.5	73	21	433.5
722	North-east	40	57	1,531.5	73	18	617.5
	South-east	40	56	1,372.5	73	18	618.0
	South-west	40	56	1,372.5	73	19	1,227.5
	North-west	40	57	1,531.5	73	19	1,227.0
723	North-east	40	57	1,331.5	73	17	8.0
	South-east	40	56	1,372.5	73	17	8.0
	South-west	40	56	1,372.5	73	18	618.0
	North-west	40	57	1,531.5	73	18	617.5
724	North-east	40	57	1,531.5	73	15	801.0
	South-east	40	56	1,372.5	73	15	801.5
	South-west	40	56	1,372.5	73	17	8.0
	North-west	40	57	1,531.5	73	17	8.0
725	North-east	40	57	1,531.5	73	14	191.5
	South-east	40	56	1,372.5	73	14	191.5
	South-west	40	56	1,372,5	73	15	801.5
	North-west	40	57	1,531.5	73	15	801.0
726	North-east	40	57	1,531.5	73	12	985.0
	South-east	40	56	1,372.5	73	12	986.0
	South-west	40	56	1,372.5	73	14	191.5
	North-west	40	57	1,531.5	73	14	191.5
727	North-east	40	57	1,531.5	73	11	375.0
	South-east	40	56	1,372.5	73	11	375.5
	South-west	40	56	1,372.5	73	12	985.0
	North-west	40	57	1,531.5	73	12	985.0
728	North-east	40	57	1,531.5	73	09	1,168.5
	South-east	40	56	1,372.5	73	09	1,169.0
	South-west	40	56	1,372.5	73	11	375.5
	North-west	40	57	1,531.5	73	11	375.0
729	North-east	....	....	.....	....	....	.....
	South-east	....	....	.....	....	....	.....
	South-west	40	56	1,372.5	73	09	1,169.0
	North-west	40	57	1,531.5	73	09	1,168.5
807	North-east	....	....	.....	....	....	.....
	South-east	40	57	1,531.5	73	39	1,344.9
	South-west	....	....	.....	....	....	.....
	North-west	....	....	.....	....	....	.....
808	North-east	....	....	.....	....	....	.....
	South-east	40	57	1,531.5	73	38	734.5
	South-west	40	57	1,531.5	73	39	1,344.5
	North-west	....	....	.....	....	....	.....
809	North-east	....	....	.....	....	....	.....
	South-east	....	....	.....	....	....	.....
	South-west	40	57	1,531.5	73	38	734.5
	North-west	....	....	.....	....	....	.....
813	North-east	....	....	.....	....	....	.....
	South-east	40	57	1,531.5	73	31	492.5
	South-west	40	57	1,531.5	73	32	1,102.0
	North-west	....	....	.....	....	....	.....
814	North-east	....	....	.....	....	....	.....
	South-east	40	57	1,531.5	73	29	1,286.5
	South-west	40	57	1,531.5	73	31	492.5
	North-west	....	....	.....	....	....	.....

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC. — (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
815	North-east	....	....	.....	...	....	.....
	South-east	40	57	1,531.5	73	28	676.0
	South-west	40	57	1,531.5	73	29	1,285.5
	North-west	....	....	.....	....	....	.....
816	North-east	40	58	1,691.0	73	27	66.0
	South-east	40	57	1,531.5	73	27	66.0
	South-west	40	57	1,531.5	73	28	676.0
	North-west	....	....	.....	....	....	.....
817	North-east	40	58	1,691.0	73	25	859.5
	South-east	40	57	1,531.5	73	25	860.0
	South-west	40	57	1,532.0	73	27	66.5
	North-west	40	58	1,691.0	73	27	66.0
818	North-east	40	58	1,681.0	73	24	250.0
	South-east	40	57	1,531.5	73	24	250.0
	South-west	40	57	1,531.5	73	25	860.0
	North-west	40	58	1,691.0	73	25	859.5
819	North-east	40	58	1,691.0	73	22	1,043.0
	South-east	40	57	1,531.5	73	22	1,043.5
	South-west	40	57	1,531.5	73	24	250.0
	North-west	40	58	1,691.0	73	24	250.0
820	North-east	40	58	1,691.0	73	21	433.5
	South-east	40	57	1,531.5	73	21	433.5
	South-west	40	57	1,531.5	73	22	1,043.5
	North-west	40	58	1,691.0	73	22	1,043.0
821	North-east	40	58	1,691.0	73	19	1,227.0
	South-east	40	57	1,531.5	73	19	1,227.0
	South-west	40	57	1,531.5	73	21	433.5
	North-west	40	58	1,691.0	73	21	433.5
822	North-east	40	58	1,691.0	73	18	617.5
	South-east	40	57	1,531.5	73	18	617.5
	South-west	40	57	1,531,5	73	19	1,227.0
	North-west	40	58	1,691.0	73	19	1,227.0
823	North-east	40	58	1,691.0	73	17	8.0
	South-east	40	57	1,531.5	73	17	8.0
	South-west	40	57	1,531.5	73	18	617.5
	North-west	40	58	1,691.0	73	18	617.5
824	North-east	40	58	1,691.0	73	15	801.0
	South-east	40	57	1,531.5	73	15	801.0
	South-west	40	57	1,531.5	73	17	8.0
	North-west	40	58	1,691.0	73	17	8.0
825	North-east	40	58	1,691.0	73	14	191.5
	South-east	40	57	1,531.5	73	14	191.5
	South-west	40	57	1,531.5	73	15	801.0
	North-west	40	58	1,691.0	73	15	801.0
826	North-east	40	58	1,691.0	73	12	984.5
	South-east	40	57	1,531.5	73	12	985.0
	South-west	40	57	1,531.5	73	14	191.5
	North-west	40	58	1,691.0	73	14	191.5
827	North-east	40	58	1,691.0	73	11	375.0
	South-east	40	57	1,531.5	73	11	375.0
	South-west	40	57	1,531.5	73	12	985.0
	North-west	40	58	1,691.0	73	12	984.5
828	North-east	40	58	1,691.0	73	09	1,168.0
	South-east	40	57	1,531.5	73	09	1,168.5
	South-west	40	57	1,531.5	73	11	375.0
	North-west	40	58	1,691.0	73	11	375.0

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.— (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
829	North-east	40	58	1,691.0	73	08	558.5
	South-east	40	57	1,531.5	73	08	558.5
	South-west	40	57	1,531.5	73	09	1,168.5
	North-west	40	58	1,691.0	73	09	1,168.0
830	North-east	40	58	1,691.0	73	06	1,351.0
	South-east	....	....	.....	....	....	.....
	South-west	40	57	1,531.5	73	08	558.5
	North-west	40	58	1,691.0	73	08	558.5
831	North-east	40	58	1,591.0	73	05	742.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	73	06	1,351.0
832	North-east	40	58	1,691.0	73	04	133.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	73	05	742.0
833	North-east	40	58	1,691.0	73	02	926.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	73	04	133.0
834	North-east	40	58	1,691.0	73	01	316.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	73	02	926.0
835	North-east	40	58	1,691.0	72	59	1,109.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	73	01	316.0
836	North-east	40	58	1,691.0	72	58	500.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	59	1,109.0
837	North-east	40	58	1,691.0	72	56	1,293.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	58	500.0
838	North-east	40	58	1,691.0	72	55	684.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	56	1,293.0
839	North-east	40	58	1,691.0	72	54	74.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	55	684.0
840	North-east	40	58	1,691.0	72	52	867.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	54	74.0
841	North-east	40	58	1,691.0	72	51	258.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	52	867.0
842	North-east	40	58	1,691.0	72	49	1,051.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	51	258.0

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.— (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
843	North-east	40	58	1,691.0	72	48	441.5
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	49	1,051.0
844	North-east	40	58	1,691.0	72	46	1,234.5
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	48	441.5
845	North-east	40	58	1,691.0	72	45	625.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	46	1,234.5
846	North-east	40	58	1,691.0	72	44	16.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	45	625.0
847	North-east	40	58	1,691.0	72	42	809.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	44	16.0
848	North-east	40	58	1,691.0	72	41	199.5
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	42	809.0
849	North-east	40	58	1,691.0	72	39	992.5
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	41	199.5
850	North-east	40	58	1,691.0	72	38	383.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	39	992.5
851	North-east	40	58	1,691.0	72	36	1,176.0
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	38	383.0
852	North-east	40	58	1,691.0	72	35	566.5
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	36	1,176.0
853	North-east	....	....	.....	....	....	.....
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	40	58	1,691.0	72	25	566.5
917	North-east	....	....	.....	....	....	.....
	South-east	40	58	1,691.0	73	25	859.5
	South-west	40	58	1,691.0	73	27	66.0
	North-west	....	....	.....	....	....	.....
918	North-east	....	....	.....	....	....	.....
	South-east	40	58	1,691.0	73	24	250.0
	South-west	40	58	1,691.0	73	25	859.5
	North-west	....	....	.....	....	....	.....
919	North-east	41	....	.....	73	22	1,042.5
	South-east	40	58	1,691.0	73	22	1,043.0
	South-west	40	58	1,691.0	73	24	250.0
	North-west	....	....	.....	....	....	.....

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.— (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
920	North-east	41	....	.....	73	21	433.5
	South-east	40	58	1,691.0	73	21	433.5
	South-west	40	58	1,691.0	73	22	1,043.0
	North-west	41	....	.....	73	22	1,042.5
921	North-east	41	....	.....	73	19	1,226.5
	South-east	40	58	1,691.0	73	19	1,227.0
	South-west	40	58	1,691.0	73	21	433.5
	North-west	41	....	.....	73	21	433.5
922	North-east	41	....	.....	73	18	617.0
	South-east	40	58	1,691.0	73	18	617.5
	South-west	40	58	1,691.0	73	19	1,227.0
	North-west	41	....	.....	73	19	1,226.5
923	North-east	41	....	.....	73	17	7.5
	South-east	40	58	1,691.0	73	17	8.0
	South-west	40	58	1,691.0	73	18	617.5
	North-west	41	....	.....	73	18	617.0
924	North-east	41	....	.....	73	15	800.5
	South-east	40	58	1,691.0	73	15	801.0
	South-west	40	58	1,691.0	77	17	8.0
	North-west	41	....	.....	73	17	7.5
925	North-east	41	....	.....	73	14	191.0
	South-east	40	58	1,691.0	73	14	191.5
	South-west	40	58	1,691.0	73	15	801.0
	North-west	41	....	.....	73	15	800.5
926	North-east	41	....	.....	73	12	984.0
	South-east	40	58	1,691.0	73	12	984.5
	South-west	40	58	1,691.0	73	14	191.5
	North-west	41	....	.....	73	14	191.0
927	North-east	41	....	.....	73	11	375.0
	South-east	40	58	1,691.0	73	11	375.0
	South-west	40	58	1,691.0	73	12	984.5
	North-west	41	....	.....	73	12	984.0
928	North-east	41	....	.....	73	9	1,167.5
	South-east	40	58	1,691.0	73	9	1,168.0
	South-west	40	58	1,691.0	73	11	375.0
	North-west	41	....	.....	73	11	375.0
929	North-east	41	....	.....	73	8	558.0
	South-east	40	58	1,691.0	73	8	558.5
	South-west	40	58	1,691.0	73	9	1,168.0
	North-west	41	....	.....	73	9	1,167.5
930	North-east	41	....	.....	73	6	1,351.5
	South-east	40	58	1,691.0	73	6	1,352.0
	South-west	40	58	1,691.0	73	8	558.5
	North-west	41	....	.....	73	8	558.0
931	North-east	44	....	.....	75	5	741.5
	South-east	40	58	1,691.0	73	5	742.0
	South-west	40	58	1,691.0	73	6	1,352.0
	North-west	41	....	.....	73	6	1,351.5
932	North-east	41	....	.....	73	4	132.5
	South-east	40	58	1,691.0	73	4	133.0
	South-west	40	58	1,691.0	73	5	742.0
	North-west	41	....	.....	73	5	741.5
933	North-east	41	....	.....	73	2	925.5
	South-east	40	58	1,691.0	73	2	926.0
	South-west	40	58	1,691.0	73	4	133.0
	North-west	41	....	.....	73	4	132.0

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.— (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
934	North-east	40	....	.....	73	1	316.0
	South-east	40	58	1,691.0	73	1	316.5
	South-west	40	58	1,691.0	73	2	926.0
	North-west	41	58	1,691.0	73	2	925.5
935	North-east	41	....	.....	73	59	1,109.0
	South-east	40	58	1,691.0	72	57	1,109.5
	South-west	40	58	1,691.0	73	1	316.5
	North-west	41	....	.....	73	1	316.0
936	North-east	41	....	.....	72	58	499.5
	South-east	40	58	1,691.0	72	58	500.0
	South-west	40	58	1,691.0	72	59	1,109.5
	North-west	41	....	.....	72	59	1,109.0
937	North-east	41	....	.....	72	56	1,292.5
	South-east	40	58	1,691.0	72	56	1,293.5
	South-west	40	58	1,691.0	72	58	500.0
	North-west	41	....	.....	72	58	499.5
938	North-east	41	....	.....	72	55	683.5
	South-east	40	58	1,691.0	72	55	684.0
	South-west	40	58	1,691.0	72	56	1,293.5
	North-west	41	....	.....	72	56	1,292.5
939	North-east	41	....	.....	72	54	74.0
	South-east	40	58	1,691.0	72	54	74.5
	South-west	40	58	1,691.0	72	55	684.0
	North-west	41	....	.....	72	55	683.5
940	North-east	41	....	.....	72	52	867.0
	South-east	40	58	1,691.0	72	52	857.5
	South-west	40	58	1,691.0	72	54	74.5
	North-west	41	....	.....	72	54	74.0
941	North-east	41	....	.....	72	51	257.5
	South-east	40	58	1,691.0	72	51	258.0
	South-west	40	58	1,691.0	72	52	867.5
	North-west	41	....	.....	72	52	867.0
942	North-east	41	....	.....	72	49	1,050.5
	South-east	40	58	1,691.0	72	49	1,051.0
	South-west	40	58	1,691.0	72	51	258.0
	North-west	41	....	.....	72	51	257.5
943	North-east	41	....	.....	72	48	441.0
	South-east	40	58	1,601.0	72	48	441.5
	South-west	40	58	1,691.0	72	48	441.5
	North-west	40	58	1,691.0	72	49	1,051.0
944	North-east	41	....	.....	72	46	1,234.0
	South-east	40	58	1,691.0	72	46	1,234.0
	South-west	40	58	1,691.0	72	48	441.5
	North-west	41	....	.....	72	48	441.0
945	North-east	41	....	.....	72	45	624.0
	South-east	40	58	1,691.0	72	45	625.0
	South-west	40	58	1,691.0	72	46	1,234.5
	North-west	41	....	.....	72	46	1,234.0
946	North-east	41	....	.....	72	44	15.5
	South-east	40	58	1,691.0	72	44	16.0
	South-west	40	58	1,691.0	72	45	625.0
	North-west	41	....	.....	72	45	624.0
947	North-east	41	....	.....	72	42	808.0
	South-east	40	58	1,691.0	72	42	809.0
	South-west	40	58	1,691.0	72	44	16.0
	North-west	41	....	.....	72	44	15.5

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.— (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
948	North-east	41	....	.....	72	41	199.0
	South-east	40	58	1,691.0	72	41	199.5
	South-west	40	58	1,691.0	72	42	809.0
	North-west	41	....	.....	72	42	808.0
949	North-east	41	....	.....	72	39	991.5
	South-east	40	58	1,691.0	72	39	992.5
	South-west	40	58	1,691.0	72	41	199.5
	North-west	41	....	.....	72	41	199.0
950	North-east	41	....	.....	72	38	382.5
	South-east	40	58	1,691.0	72	38	383.0
	South-west	40	58	1,691.0	72	39	992.5
	North-west	41	....	.....	72	39	991.5
951	North-east	41	....	.....	72	36	1,175.0
	South-east	40	58	1,691.0	72	36	1,176.0
	South-west	40	58	1,691.0	72	38	383.0
	North-west	41	....	.....	72	38	382.5
952	North-east	41	....	.....	72	35	566.0
	South-east	40	58	1,691.0	72	35	566.5
	South-west	40	58	1,691.0	72	36	1,176.0
	North-west	41	....	.....	72	36	1,175.0
953	North-east	41	....	.....	72	33	1,359.0
	South-east	....	....	.....	....	....	.....
	South-west	40	58	1,691.0	72	35	566.5
	North-west	41	....	.....	72	35	566.0
954	North-east	....	....	.....	....	....	.....
	South-east	....	....	.....	....	....	.....
	South-west	....	....	.....	....	....	.....
	North-west	41	....	.....	72	33	1,359.0
1120	North-east	....	....	.....	....	....	.....
	South-east	41	....	.....	73	21	433.5
	South-west	41	....	.....	73	22	1,042.5
	North-west	....	....	.....	....	....	.....
1121	North-east	....	....	.....	....	....	.....
	South-east	41	....	.....	73	19	1,226.5
	South-west	41	....	.....	73	21	433.5
	North-west	....	....	.....	....	....	.....
1122	North-east	41	1	161.0	73	18	616.5
	South-east	41	...	.....	73	18	617.0
	South-west	41	....	.....	73	19	1,226.5
	North-west	....	....	.....	....	....	.....
1123	North-east	41	1	161.0	73	17	7.0
	South-east	41	....	.....	73	17	7.5
	South-west	41	....	.....	73	18	617.0
	North-west	41	1	161.0	73	18	616.5
1124	North-east	41	1	161.0	73	15	800.0
	South-east	41	....	.....	73	15	800.5
	South-west	41	....	.....	73	17	7.5
	North-west	41	1	161.0	73	17	7.0
1125	North-east	41	1	161.0	73	14	190.5
	South-east	41	....	.....	73	14	191.0
	South-west	41	....	.....	73	15	800.5
	North-west	41	1	161.0	73	15	800.0
1126	North-east	41	1	161.0	73	12	983.5
	South-east	41	....	.....	73	12	984.0
	South-west	41	....	.....	73	14	191.0
	North-west	41	1	161.0	73	14	190.5

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.— (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
1127	North-east	41	1	161.0	73	11	374.5
	South-east	41	....	.....	73	11	375.0
	South-west	41	....	.....	73	12	984.0
	North-west	41	1	161.0	73	12	983.5
1128	North-east	41	1	161.0	73	9	1,167.0
	South-east	41	....	.....	73	9	1,167.5
	South-west	41	....	.....	73	11	375.0
	North-west	41	1	161.0	73	11	374.5
1129	North-east	41	1	161.0	73	8	557.5
	South-east	41	....	.....	73	8	558.0
	South-west	41	....	.....	73	9	1,167.5
	North-west	41	1	161.0	73	9	1,167.0
1130	North-east	41	1	161.0	73	6	1,350.5
	South-east	41	....	.....	73	6	1,351.5
	South-west	41	....	.....	73	8	558.0
	North-west	41	1	161.0	73	8	557.5
1131	North-east	41	1	161.0	73	5	741.0
	South-east	41	....	.....	73	5	741.5
	South-west	41	....	.....	73	6	1,351.5
	North-west	41	1	161.0	73	6	1,350.5
1132	North-east	41	1	161.0	73	4	132.0
	South-east	41	....	.....	73	4	132.5
	South-west	41	....	.....	73	5	741.5
	North-west	41	1	161.0	73	5	741.0
1133	North-east	41	1	161.0	73	2	924.5
	South-east	41	....	.....	73	2	925.5
	South-west	41	....	.....	73	4	132.5
	North-west	41	1	161.0	73	4	132.0
1134	North-east	41	1	161.0	73	1	315.5
	South-east	41	....	.....	73	1	316.0
	South-west	41	....	.....	73	2	925.5
	North-west	41	1	161.0	73	2	924.5
1135	North-east	41	1	161.0	72	59	1,108.0
	South-east	41	....	.....	72	59	1,109.0
	South-west	41	....	.....	73	1	316.0
	North-west	41	1	161.0	73	1	315.5
1136	North-east	41	1	161.0	72	58	499.0
	South-east	41	....	.....	72	58	499.5
	South-west	41	....	.....	72	59	1,109.0
	North-west	41	1	161.0	72	59	1,108.0
1137	North-east	41	1	161.0	72	56	1,291.5
	South-east	41	....	.....	72	56	1,292.5
	South-west	41	....	.....	72	58	499.5
	North-west	41	1	161.0	72	58	499.0
1138	North-east	41	1	161.0	72	55	682.5
	South-east	41	....	.....	72	55	683.5
	South-west	41	....	.....	72	56	1,292.5
	North-west	41	1	161.0	72	56	1,291.5
1139	North-east	41	1	161.0	72	54	73.5
	South-east	41	....	.....	72	54	74.0
	South-west	41	....	.....	72	55	683.5
	North-west	41	1	161.0	72	55	682.5
1140	North-east	41	1	161.0	72	52	866.0
	South-east	41	....	.....	72	52	867.0
	South-west	41	....	.....	72	54	74.0
	North-west	41	1	161.0	72	54	73.5

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.— (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
1141	North-east	41	1	161.0	72	51	257.0
	South-east	41	....	.....	72	51	257.5
	South-west	41	....	.....	72	52	867.0
	North-west	41	1	161.0	72	52	866.0
1142	North-east	41	1	161.0	72	49	1,049.5
	South-east	41	....	.....	72	49	1,050.5
	South-west	41	....	.....	72	51	257.5
	North-west	41	1	161.0	72	51	257.0
1143	North-east	41	1	161.0	72	48	440.0
	South-east	41	....	.....	72	48	441.0
	South-west	41	....	.....	72	49	1,050.5
	North-west	41	1	161.0	72	49	1,049.5
1144	North-east	41	1	161.0	72	46	1,233.0
	South-east	41	....	.....	72	46	1,234.0
	South-west	41	....	.....	72	48	441.0
	North-west	41	1	161.0	72	48	440.0
1145	North-east	41	1	161.0	72	45	623.5
	South-east	41	....	.....	72	45	624.0
	South-west	41	1	161.0	72	46	1,234.0
	North-west	41	1	161.0	72	46	1,233.0
1146	North-east	41	1	161.0	72	44	14.5
	South-east	41	....	.....	72	44	15.5
	South-west	41	....	.....	72	45	624.0
	North-west	41	1	161.0	72	45	623.5
1147	North-east	41	1	161 0	72	42	807.0
	South-east	41	....	.....	72	42	808.0
	South-west	41	....	.....	72	44	15.5
	North-west	41	....	.....	72	44	14.5
1148	North-east	41	1	161.0	72	41	198.0
	South-east	41	....	.....	72	41	199.0
	South-west	41	....	.....	72	42	808.0
	North-west	41	1	161.0	72	42	807.0
1149	North-east	41	1	161 0	72	39	990.5
	South-east	41	....	.....	72	39	991.5
	South-west	41	....	.....	72	41	199.0
	North-west	41	1	161.0	72	41	198.0
1150	North-east	41	1	161.0	72	38	381.5
	South-east	41	....	.....	72	38	382.5
	South-west	41	....	.....	72	39	991.5
	North-west	41	1	161.0	72	39	990.5
1151	North-east	41	1	161.0	72	36	1,174.0
	South-east	41	....	.....	72	36	1,175.0
	South-west	41	....	.....	72	38	382.5
	North-west	41	1	161.0	72	38	381.5
1152	North-east	41	1	161.0	72	35	565.0
	South-east	41	....	.....	72	35	566.0
	South-west	41	....	.....	72	36	1,175.0
	Nroth-west	41	1	161.0	72	36	1,174.0
1153	North-east	41	1	161.0	72	33	1,357.5
	South-east	41	....	.....	72	33	1,359.0
	South-west	41	....	.....	72	35	566.0
	North-west	41	1	161.0	72	35	565.0
1154	North-east	41	1	161.0	72	32	748.0
	South-east	41	....	.....	72	32	.....
	South-west	41	....	.....	72	33	1,359.0
	North-west	41	1	161.0	72	33	1,357.5

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.— (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
2222	North-east	....	....	.....	....	....	.....
	South-east	41	1	161.0	73	18	616.5
	South-west	....	....	.....	....	....	.....
	North-west	....	....	.....	....	....	.....
2223	North-east	....	....	.....	....	....	.....
	South-east	41	1	161.0	73	17	7.0
	South-west	41	1	161.0	73	18	616.5
	North-west	....	....	.....	....	....	.....
2224	North-east	....	....	.....	....	....	.....
	South-east	41	1	161.0	73	15	800.0
	South-west	41	1	161.0	73	17	7.0
	North-west	....	....	.....	....	....	.....
2225	North-east	....	....	.....	....	....	.....
	South-east	41	1	161.0	73	14	190.5
	South-west	41	1	161.0	73	15	800.0
	North-west	....	....	.....	....	....	.....
2226	North-east	41	2	322.5	73	12	983.0
	South-east	41	1	161.0	73	12	983.5
	South-west	41	1	161.0	73	14	190.5
	North-west	....	....	.....	....	....	.....
2227	North-east	41	2	322.5	73	11	374.0
	South-east	41	1	161.0	73	11	374.5
	South-west	41	1	161.0	73	12	983.5
	North-west	41	2	322.5	73	12	983.0
2228	North-east	41	2	322.5	73	9	1,166.5
	South-east	41	1	161.0	73	9	1,167.0
	South-west	41	1	161.0	73	11	374.5
	North-west	41	2	322.5	73	11	374.0
2229	North-east	41	2	322.5	73	8	557.0
	South-east	41	1	161.0	73	8	557.5
	South-west	41	1	161.0	73	9	1,167.0
	North-west	41	2	322.5	73	9	1,166.5
2230	North-east	41	2	322.5	73	6	5,349.5
	South-east	41	1	161.0	73	6	1,350.5
	South-west	41	1	161.0	73	8	557.5
	North-west	41	2	322.5	73	8	557.0
2231	North-east	41	2	322.5	73	5	740.5
	South-east	41	1	161.0	73	5	741.0
	South-west	41	1	161.0	73	6	1,350.5
	North-west	41	2	322.5	73	6	1,349.5
2232	North-east	41	2	322.5	73	4	131.5
	South-east	41	1	161.0	73	4	132.0
	South-west	41	1	161.0	73	5	741.0
	North-west	41	2	322.5	73	5	740.5
2233	North-east	41	2	322.5	73	2	924.0
	South-east	41	1	161.0	73	2	924.5
	South-west	41	1	161.0	73	4	924.5
	North-west	41	2	322.5	73	4	131.5
2234	North-east	41	2	322.5	73	1	315.0
	South-east	41	1	161.0	73	1	315.5
	South-west	41	1	161.0	73	2	924.5
	North-west	41	2	322.5	73	2	924.0
2235	North-east	41	2	322.5	72	59	1,107.5
	South-east	41	1	161.0	72	59	1,108.0
	South-west	41	1	161.0	72	1	315.5
	North-west	41	2	322.5	73	1	315.0

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.— (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
2236	North-east	41	2	322.5	72	58	498.5
	South-east	41	1	161.0	72	58	499.0
	South-west	41	1	161.0	72	59	1,108.0
	North-west	41	2	322.5	72	59	1,107.5
2237	North-east	41	2	322.5	72	56	1,291.0
	South-east	41	1	161.0	72	56	1,291.5
	South-west	41	1	161.0	72	58	499.0
	North-west	41	2	322.5	72	58	498.0
2238	North-east	41	2	322.5	72	55	682.0
	South-east	41	1	161.0	72	55	682.5
	South-west	41	1	167.0	72	56	1,291.5
	North-west	41	2	322.5	72	56	1,291.0
2239	North-east	41	2	322.5	72	54	73.0
	South-east	41	1	322.5	72	54	73.5
	South-west	41	1	161.0	72	55	682.5
	North-west	41	2	322.5	72	55	682.0
2240	North-east	41	2	322.5	72	52	865.5
	South-east	41	1	161.0	72	52	866.0
	South-west	41	1	161.0	72	53	73.5
	North-west	41	2	322.5	72	54	73.0
2241	North-east	41	2	322.5	72	51	256.5
	South-east	41	1	161.0	72	51	257.0
	South-west	41	1	161.0	72	52	866.0
	North-west	41	2	322.5	72	52	865.5
2242	North-east	41	2	322.5	72	49	1,048.5
	South-east	41	1	161.0	72	49	1,049.5
	South-west	41	1	161.0	72	51	257.0
	North-west	41	2	322.5	72	51	256.5
2243	North-east	41	2	322.5	72	48	439.5
	South-east	41	1	161.0	72	48	440.0
	South-west	41	1	161.0	72	49	1,049.5
	North-west	41	2	322.5	72	49	1,048.5
2244	North-east	41	2	322.5	72	46	1,232.0
	South-east	41	1	161.0	72	46	1,232.0
	South-west	41	1	161.0	72	48	440.0
	North-west	41	2	322.5	72	48	439.5
2245	North-east	41	2	322.5	72	45	623.0
	South-east	41	1	161.0	72	45	623.5
	South-west	41	1	162.0	72	46	1,233.0
	North-west	41	2	322.5	72	46	1,232.0
2246	North-east	41	2	322.5	72	44	14.0
	South-east	41	1	161.0	72	44	14.5
	South-west	41	1	161.0	72	45	623.5
	North-west	41	2	322.5	72	45	623.0
2247	North-east	41	2	322.5	72	42	806.0
	South-east	41	1	161.0	72	42	807.0
	South-west	41	1	161.0	72	44	14.5
	North-west	41	2	322.5	72	44	14.0
2248	North-east	41	2	322.5	72	41	197.5
	South-east	41	1	161.0	72	41	198.0
	South-west	41	1	161.0	72	42	807.0
	North-west	41	2	322.5	72	42	806.0
2249	North-east	41	2	322.5	72	39	989.5
	South-east	41	1	161.0	72	39	990.5
	South-west	41	1	161.0	72	41	198.0
	North-west	41	2	322.5	72	41	197.5

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.— (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
2250	North-east	41	2	322.5	72	38	381.0
	South-east	41	1	161.0	72	38	381.5
	South-west	41	1	161.0	72	39	990.5
	North-west	41	2	322.5	72	39	989.5
2251	North-east	41	2	322.5	72	36	1,174.0
	South-east	41	1	161.0	72	36	1,173.0
	South-west	41	1	161.0	72	38	381.5
	North-west	41	2	322.5	72	38	381.0
2252	North-east	41	2	322.5	72	35	564.0
	South-east	41	1	161.0	72	35	565.0
	South-west	41	1	161.0	72	36	1,174.0
	North-west	41	2	322.5	72	36	1,173.0
2253	North-east	41	2	322.5	72	33	1,356.5
	South-east	41	1	161.0	72	33	1,357.5
	South-west	41	1	161.0	72	35	565.0
	North-west	41	2	322.5	72	35	564.0
2254	North-east	41	2	322.5	72	32	747.0
	South-east	41	1	161.0	72	32	748.0
	South-west	41	1	161.0	72	33	1,357.5
	North-west	41	2	322.5	72	33	1,356.5
2255	North-east	41	2	322.5	72	31	138.5
	South-east	41	1	161.0	72	31	139.5
	South-west	41	1	161.0	72	32	748.0
	North-west	41	2	322.5	72	32	747.0
2256	North-east	41	2	322.5	72	29	931.0
	South-east	41	1	161.0	72	29	932.0
	South-west	41	1	161.0	72	31	139.5
	North-west	41	2	322.5	72	31	138.5
3329	North-east	....	....	.....	....	....	.....
	South-east	41	2	322.5	73	8	557.0
	South-west	41	2	322.5	73	9	1,166.5
	North-west	....	....	.....	....	....	.....
3330	North-east	41	3	484.5	73	6	1,349.0
	South-east	41	2	322.5	73	6	1,349.5
	South-west	41	2	322.5	73	8	557.0
	North-west	....	....	.....	....	....	.....
3331	North-east	41	3	484.5	73	5	740.0
	South-east	41	2	822.5	73	5	740.5
	South-west	41	2	322.5	73	6	1,349.5
	North-west	41	3	484.5	73	6	1,349.0
3332	North-east	41	3	484.5	73	4	131.0
	South-east	41	2	322.5	73	4	131.5
	South-west	41	2	322.5	73	5	740.5
	North-west	41	3	484.5	73	5	740.0
3333	North-east	41	3	484.5	73	2	923.0
	South-east	41	2	322.5	73	2	924.0
	South-west	41	2	322.5	73	4	131.5
	North-west	41	3	484.5	73	4	131.0
3334	North-east	41	3	484.5	73	1	314.5
	South-east	41	2	322.5	73	1	315.0
	South-west	41	2	322.5	73	2	924.0
	North-west	41	3	322.5	73	2	923.0
3335	North-east	41	3	484.5	73	59	1,106.5
	South-east	41	2	322.5	72	59	1,107.5
	South-west	41	2	322.5	73	1	315.0
	North-west	41	3	484.5	73	1	314.5

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.— (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
3336	North-east	41	3	484.5	72	58	497.5
	South-east	41	2	322.5	72	58	498.5
	South-west	41	2	322.5	72	59	1,107.5
	North-west	41	3	484.5	72	59	1,106.5
3337	North-east	41	3	484.5	72	56	1,290.0
	South-east	41	2	322.5	72	56	1,291.0
	South-west	41	2	322.5	72	58	498.5
	North-west	41	3	484.5	72	58	497.5
3338	North-east	41	3	484.5	72	55	681.0
	South-east	41	2	322.5	72	55	682.0
	South-west	41	2	322.5	72	56	1,291.0
	North-west	41	3	484.5	72	56	1,290.0
3339	North-east	41	3	484.5	72	54	72.0
	South-east	41	2	322.5	72	54	73.0
	South-west	41	2	322.5	72	55	682.0
	North-west	41	3	484.5	72	55	681.0
3340	North-east	41	3	484.5	72	52	864.5
	South-east	41	2	322.5	72	52	865.5
	South-west	41	2	322.5	72	54	73.0
	North-west	41	3	484.5	72	54	72.0
3341	North-east	41	3	484.5	72	51	255.5
	South-east	41	2	322.5	72	51	256.5
	South-west	41	2	322.5	72	52	865.5
	North-west	41	3	484.5	72	52	864.5
3342	North-east	41	3	484.5	72	49	1,047.5
	South-east	41	2	322.5	72	49	1,048.5
	South-west	41	2	322.5	72	51	256.5
	North-west	41	3	484.5	72	51	255.5
3343	North-east	41	3	484.5	72	48	439.0
	South-east	41	2	322.5	72	48	439.5
	South-west	41	2	322.5	72	49	1,048.5
	North-west	41	3	484.5	72	49	1,047.5
3344	North-east	41	3	484.5	72	46	1,231.0
	South-east	41	2	322.5	72	46	1,232.0
	South-west	41	2	322.5	72	48	439.5
	North-west	41	3	484.5	72	48	439.0
3345	North-east	41	3	484.5	72	45	622.0
	South-east	41	2	322.5	72	45	623.0
	South-west	41	2	322.5	72	46	1,232.0
	North-west	41	3	484.5	72	46	1,231.0
3346	North-east	41	3	484.5	72	44	13.0
	South-east	41	2	322.5	72	44	14.0
	South-west	41	2	322.5	72	45	623.0
	North-west	41	3	484.5	72	45	622.0
3347	North-east	41	3	484.5	72	42	806.0
	South-east	41	2	322.5	72	42	806.0
	South-west	41	2	322.5	72	44	14.0
	North-west	41	3	484.5	72	44	13.0
3348	North-east	41	3	484.5	72	41	196.5
	South-east	41	2	322.5	72	41	197.5
	South-west	41	2	322.5	72	42	806.0
	North-west	41	3	484.5	72	42	806.0
3349	North-east	41	3	484.5	72	39	988.5
	South-east	41	2	322.5	72	39	989.5
	South-west	41	2	322.5	72	41	197.5
	North-west	41	3	484.5	72	41	196.5

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC. — (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
3350	North-east	41	3	484.5	72	38	380.0
	South-east	41	2	322.5	72	38	381.0
	South-west	41	2	321.5	72	39	989.5
	North-west	41	3	484.5	72	39	988.5
3351	North-east	41	3	484.5	72	36	1,172.0
	South-east	41	2	322.5	72	36	1,173.0
	South-west	41	3	484.5	72	38	381.0
	North-west	41	3	484.5	72	38	380.0
3352	North-east	41	3	484.5	72	35	563.0
	South-east	41	2	322.5	72	35	564.0
	South-west	41	2	322.5	72	36	1,173.0
	North-west	41	3	484.5	72	36	1,172.0
3353	North-east	41	3	484.5	72	35	1,355.0
	South-east	41	2	322.5	72	33	1,356.5
	South-west	41	3	322.5	72	35	564.0
	North-west	41	3	484.5	72	35	563.0
3354	North-east	41	3	484.5	72	32	746.0
	South-east	41	2	322.5	72	32	747.0
	South-west	41	2	322.5	72	33	1,356.5
	North-west	41	3	484.5	72	33	1,355.0
3355	North-east	41	3	484.5	72	31	137.5
	South-east	41	2	322.5	72	31	138.5
	South-west	41	2	322.5	72	32	747.0
	North-west	41	3	484.5	72	32	746.0
3356	North-east	41	3	484.5	72	29	929.5
	South-east	41	3	322.5	72	29	931.0
	South-west	41	2	322.5	72	31	138.5
	North-west	41	3	484.5	72	31	137.5
4431	North-east	....	....	.....	....	....	.....
	South-east	41	3	484.5	73	5	740.0
	South-west	41	3	484.5	73	6	1,349.0
	North-west	....	....	.....	....	....	.....
4432	North-east	....	....	.....	....	....	.....
	South-east	41	3	484.5	73	4	131.0
	South-west	41	3	484.5	73	5	740.0
	North-west	....	....	.....	....	....	.....
4433	North-east	41	4	647.0	73	2	922.5
	South-east	41	3	484.5	73	2	923.0
	South-west	41	3	484.5	73	4	131.0
	North-west	....	....	.....	....	....	.....
4434	North-east	41	4	647.0	73	1	313.5
	South-east	41	3	484.5	73	1	314.5
	South-west	41	3	484.5	73	2	923.0
	North-west	41	4	647.0	73	2	922.5
4435	North-east	41	4	647.0	72	59	1,106.0
	South-east	41	3	484.5	72	59	1,106.5
	South-west	41	3	484.5	73	1	314.5
	North-west	41	4	647.0	73	1	313.5
4436	North-east	41	4	647.0	72	58	497.0
	South-east	41	3	484.5	72	58	497.5
	South-west	41	3	484.5	72	59	1,106.5
	North-west	41	4	647.0	72	59	1,106.0
4437	North-east	41	4	647.0	72	56	1,289.0
	South-east	41	3	484.5	72	56	1,290.0
	South-west	41	3	484.5	72	58	497.5
	North-west	41	4	647.0	72	58	497.0

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.— (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres
4438	North-east	41	4	647.0	72	55	680.0
	South-east	41	3	484.5	72	55	681.0
	South-west	41	3	484.5	72	56	1,290.0
	North-west	41	4	647.0	72	56	1,289.0
4439	North-east	41	4	647.0	72	54	71.5
	South-east	41	3	484.5	72	54	72.0
	South-west	41	3	484.5	72	55	681.0
	North-west	41	4	647.0	72	55	680.0
4440	North-east	41	4	647.0	72	52	863.5
	South-east	41	3	484.5	72	52	864.5
	South-west	41	3	484.5	72	54	72.0
	North-west	41	4	647.0	72	54	71.5
4441	North-east	41	4	647.0	72	51	254.5
	South-east	41	3	484.5	72	51	255.5
	South-west	41	3	484.5	72	52	864.5
	North-west	41	4	647.0	72	52	863.5
4442	North-east	41	4	647.0	72	49	1,046.5
	South-east	41	3	484.5	72	49	1,047.5
	South-west	41	3	484.5	72	51	255.5
	North-west	41	4	647.0	72	51	254.5
4443	North-east	41	4	647.0	72	48	438.0
	South-east	41	3	484.5	72	48	439.0
	South-west	41	3	484.5	72	49	1,047.5
	North-west	41	4	647.0	72	49	1,046.5
4444	North-east	41	4	647.0	72	46	1,230.0
	South-east	41	3	484.5	72	46	1,231.0
	South-west	41	3	484.5	72	48	439.0
	North-west	41	4	647.0	72	48	438.0
4445	North-east	41	4	647.0	72	45	621.0
	South-east	41	3	484.5	72	45	622.0
	South-west	41	3	484.5	72	46	1,231.0
	North-west	41	4	647.0	72	46	1,230.0
4446	North-east	41	4	647.0	72	44	12.5
	South-east	41	3	484.5	72	44	13.0
	South-west	41	3	484.5	72	45	622.0
	North-west	41	4	647.0	72	45	621.0
4447	North-east	41	4	647.0	72	42	804.0
	South-east	41	3	484.5	72	42	805.0
	South-west	41	3	484.5	72	44	13.0
	North-west	41	4	647.0	72	44	12.5
4448	North-east	41	4	647.0	72	41	195.5
	South-east	41	3	484.5	72	41	196.5
	South-west	41	3	484.5	72	42	805.0
	North-west	41	4	647.0	72	42	804.0
4449	North-east	41	4	647.0	72	39	987.5
	South-east	41	3	484.5	72	39	988.5
	South-west	41	3	484.5	72	41	196.5
	North-west	41	4	647.0	72	41	195.5
4450	North-east	41	4	647.0	72	38	379.0
	South-east	41	3	484.5	72	38	380.0
	South-west	41	3	484.5	72	39	988.5
	North-west	41	4	647.0	72	39	987.5
4451	North-east	41	4	647.0	72	36	1,170.5
	South-east	41	3	484.5	72	36	1,173.0
	South-west	41	3	484.5	72	38	380.0
	North-west	41	4	647.0	72	38	379.0

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.—(*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
4452	North-east	41	4	647.0	72	35	562.0
	South-east	41	3	484.5	72	35	563.0
	South-west	41	3	484.5	72	36	1,172.0
	North-west	41	4	647.0	72	36	1,170.5
4453	North-east	41	4	647.0	72	38	1,354.0
	South-east	41	3	484.5	72	38	1,355.0
	South-west	41	3	484.5	72	35	563.0
	North-west	41	4	647.0	72	35	562.0
4454	North-east	41	4	647.0	72	32	745.0
	South-east	41	3	484.5	72	32	746.0
	South-west	41	3	484.5	72	33	1,355.0
	North-west	41	4	647.9	72	33	1,354.0
4455	North-east	41	4	647.0	72	31	136.5
	South-east	41	3	484.5	72	31	137.5
	South-west	41	3	484.5	72	32	746.0
	North-west	41	4	647.0	72	32	745.0
4456	North-east	41	4	647.0	72	29	928.5
	South-east	41	3	484.5	72	29	929.5
	South-west	41	3	484.5	72	31	137.5
	North-west	41	4	647.0	72	31	136.5
4457	North-east	41	4	647.0	72	28	320.0
	South-east	41	3	484.5	72	28	321.0
	South-west	41	3	484.5	72	29	929.5
	North-west	41	4	647.0	72	29	928.5
4458	North-east	41	4	647.0	72	26	1,111.5
	South-east	41	3	484.5	72	26	1,113.0
	South-west	41	3	484.5	72	28	321.0
	North-west	41	4	647.0	72	28	320.0
5535	North-east	....	....	.....	....	....	.....
	South-east	41	4	674.0	72	59	1,106.0
	South-west	41	4	647.0	73	1	13.5
	North-west	....	....	.....	....	....	.....
5536	North-east	...	....	.....	....	....	... .
	South-east	41	4	647.0	72	58	497.0
	South-west	41	4	647.0	72	59	1,106.0
	North-west	....	....	.....	....	....	.....
5537	North-east	41	5	810.5	72	56	1,288.0
	South-east	41	4	647.0	72	56	1,289.0
	South-west	41	4	647.0	72	58	497.0
	North-west	....	....	.....	....	....	.....
5538	North-east	41	5	810.6	72	55	679.0
	South-east	41	4	647.0	72	55	680.0
	South-west	41	4	647.0	72	56	1,289.0
	North-west	41	5	810.5	72	56	1,288.0
5539	North-east	41	5	810.5	72	54	70.5
	South-east	41	4	647.0	72	54	71.5
	South-west	41	4	647.0	72	55	680.0
	North-west	41	5	810.5	62	55	679.0
5540	North-east	41	5	810.5	72	52	862.5
	South-east	41	4	647.0	72	52	863.5
	South-west	41	4	647.0	72	64	71.5
	North-west	41	5	810.5	72	54	70.5
5541	North-east	41	5	810.5	72	51	253.5
	South-east	41	4	647.0	72	51	254.5
	South-west	41	4	647.0	72	52	863.5
	North-west	41	5	810.5	72	52	862.5

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.— (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
5542	North-east	41	5	810.5	72	49	1,045.5
	South-east	41	4	647.0	72	49	1,046.5
	South-west	41	4	647.0	72	51	254.5
	North-west	41	5	810.5	72	52	253.5
5543	North-east	41	5	810.5	72	48	437.0
	South-east	41	4	647.0	72	48	438.0
	South-west	41	4	647.0	72	49	1,046.5
	North-west	41	5	810.5	72	49	1,045.5
5544	North-east	41	5	810.5	72	46	1,228.5
	South-east	41	4	647.0	72	46	1,230.0
	South-west	41	4	647.0	72	48	438.0
	North-west	41	5	810.5	72	48	437.0
5545	North-east	41	5	810.5	72	45	620.0
	South-east	41	4	647.0	72	45	621.0
	South-west	41	4	647.0	72	46	1,230.0
	North-west	41	5	810.5	22	46	1,228.5
5546	North-east	41	5	810.5	72	44	11.5
	South-east	41	4	647.0	72	44	12.5
	South-west	41	4	647.0	72	45	621.0
	North-west	41	5	810.5	72	45	620.0
5547	North-east	41	5	810.5	72	42	803.0
	South-east	41	4	647.0	72	42	804.0
	South-west	41	4	647.0	72	44	12.5
	North-west	41	5	810.5	72	44	11.5
5548	North-east	41	5	810.5	72	41	194.5
	South-east	41	4	647.0	72	41	195.6
	South-west	41	4	647.0	72	42	804.0
	North-west	41	5	810.5	72	42	803.0
5549	North-east	41	5	810.5	72	39	986.5
	South-east	41	4	647.0	72	39	987.5
	South-west	41	4	647.0	72	41	195.5
	North-west	41	5	810.5	72	41	194.5
5550	North-east	41	5	810.5	72	38	378.0
	South-east	41	4	647.0	72	38	379.0
	South-west	41	4	647.0	72	39	987.5
	North-west	41	5	810.5	72	39	986.5
5551	North-east	41	5	810.5	72	36	1,169.5
	South-east	41	4	647.0	72	36	1,170.5
	South-west	41	4	647.0	72	38	379.0
	North-west	41	5	810.5	72	38	378.0
5552	North-east	41	5	810.5	72	35	561.0
	South-east	41	4	647.0	72	35	562.0
	South-west	41	4	647.0	72	36	1,170.5
	North-west	41	5	810.5	72	36	1,169.5
5553	North-east	41	5	810.5	72	33	1,352.5
	South-east	41	4	647.0	72	33	1,354.0
	South-west	41	4	647.0	72	35	562.0
	North-west	41	5	810.5	72	35	561.0
5554	North-east	41	5	810.5	72	32	744.0
	South-east	41	4	647.0	72	32	745.0
	South-west	41	4	647.0	72	33	1,354.0
	North-west	41	5	810.5	72	33	1,352.5
5555	North-east	41	5	810.5	72	31	135.5
	South-east	41	4	647.0	72	31	136.5
	South-west	41	4	647.0	72	32	745.0
	North-west	41	4	810.0	72	32	744.0

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GEOGRAPHICAL POSITION OF THE TOWNSHIPS, ETC.—(*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
5556	North-east	41	5	810.5	72	29	927.0
	South-east	41	4	647.0	72	29	928.5
	South-west	41	4	647.0	72	31	136.5
	North-west	41	5	810.5	72	31	135.5
5557	North-east	41	5	810.5	72	28	319.0
	South-east	41	4	647.0	72	28	320.0
	South-west	41	4	647.0	72	29	928.5
	North-west	41	5	810.5	72	29	927.0
5558	North-east	41	5	810.5	72	26	1,110.5
	South-east	41	4	647.0	72	26	1,111.5
	South-west	41	4	647.0	72	28	320.0
	North-west	41	5	810.5	72	28	319.0
6640	North-east	....	....	.....	....	....	.....
	South-east	41	5	810.5	72	52	862.5
	South-west	41	5	810.5	72	54	70.5
	North-west	....	....	.....	....	....	.....
6641	North-east	....	....	.....	....	....	.....
	South-east	41	5	810.5	72	51	253.5
	South-west	41	5	810.5	72	52	862.5
	North-west	....	....	.....	....	....	.....
6642	North-east	41	6	974.0	72	49	1,045.0
	South-east	41	5	810.5	72	49	1,045.5
	South-west	41	5	810.5	72	51	253.5
	North-west	....	....	.....	....	....	.....
6643	North-east	41	6	974.0	72	48	436.5
	South-east	41	4	810.5	72	48	437.0
	South-west	41	5	810.5	72	49	1,045.5
	North-west	41	6	974.0	72	49	1,045.0
6644	North-east	41	6	974.0	72	46	1,228.0
	South-east	41	5	810.5	72	46	1,228.5
	South-west	41	5	810.5	72	48	437.0
	North-west	41	6	974.0	72	48	436.5
6645	North-east	41	6	974.0	72	45	619.5
	South-east	41	5	810.5	72	45	620.0
	South-west	41	5	810.5	72	49	1,228.5
	North-west	41	6	974.0	72	46	1,228.0
6646	North-east	41	6	974.0	72	44	11.0
	South-east	41	5	810.5	72	44	11.5
	South-west	41	5	810.5	72	45	620.0
	North-west	41	6	974.0	72	45	619.5
6647	North-east	41	6	974.0	72	42	802.5
	South-east	41	5	810.5	72	42	810.0
	South-west	41	5	810.5	72	44	11.5
	North-west	41	6	974.0	72	44	11.0
6648	North-east	41	6	974.0	72	41	194.0
	South-east	41	5	810.5	72	41	194.5
	South-west	41	5	810.5	72	42	803.0
	North-west	41	6	974.0	72	42	802.5
6649	North-east	41	6	974.0	72	39	985.5
	South-east	41	5	810.5	72	39	986.5
	South-west	41	5	810.5	72	41	194.5
	North-west	41	6	974.0	72	41	194.0
6650	North-east	41	6	974.0	72	38	377.0
	South-east	41	5	810.5	72	38	378.0
	South-west	41	5	810.5	72	39	986.5
	North-west	41	6	974.0	72	39	985.5

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC. — (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
6651	North-east	41	6	974.0	72	36	1,168.5
	South-east	41	5	810.5	72	36	1,169.5
	South-west	41	5	810.5	72	38	378.0
	North-west	41	6	974.0	72	38	377.0
6652	North-east	41	6	974.0	72	35	560.0
	South-east	41	5	810.5	72	35	561.0
	South-west	41	5	810.5	72	36	1,169.5
	North-west	41	6	974.0	72	36	1,168.5
6653	North-east	41	6	974.0	72	33	1,351.5
	South-east	41	5	810.5	72	33	1,352.5
	South-west	41	5	810.5	72	35	561.0
	North-west	41	6	974.0	72	35	560.0
6654	North-east	41	6	974.0	72	32	743.0
	South-east	41	5	810.5	72	32	744.0
	South-west	41	5	810.5	72	33	1,352.5
	North-west	41	6	974.0	72	33	1,351.5
6655	North-east	41	6	974.0	72	31	134.5
	South-east	41	5	810.5	72	31	135.5
	South-west	41	5	810.5	72	32	744.0
	North-west	41	6	974.0	72	32	743.0
6656	North-east	41	6	974.0	72	29	926.0
	South-east	41	5	810.5	72	29	927.0
	South-west	41	5	810.5	72	31	135.5
	North-west	41	6	974.0	72	31	134.5
6657	North-east	41	6	974.0	72	28	318.0
	South-east	41	5	810.5	72	28	319.0
	South-west	41	5	810.5	72	29	927.0
	North-west	41	6	974.0	72	29	926.0
6658	North-east	41	6	974.0	72	26	1,109.5
	South-east	41	5	810.5	72	26	1,110.5
	South-west	41	5	810.5	72	28	319.0
	North-west	41	6	974.0	72	28	318.0
6659	North-east	41	6	974.0	72	25	500.5
	South-east	41	5	810.5	72	25	501.5
	South-west	41	5	810.5	72	26	1,110.5
	North-west	41	6	974.0	72	26	1,109.5
6660	North-east	41	6	974.0	72	23	1,292.5
	South-east	41	5	810.5	72	23	1,293.5
	South-west	41	5	810.5	72	25	501.5
	North-west	41	6	974.0	72	25	500.5
7745	North-east	....	....	.....	...	....	.....
	South-east	41	6	974.0	72	45	619.5
	South-west	41	6	974.0	72	46	1,228.0
	North-west	....	....	.....	....	....	.....
7746	North-east	41	7	1,138.5	72	44	10.0
	South-east	41	6	974.0	72	44	11.0
	South-west	41	6	974.0	72	45	619.5
	North-west	....	....	.....	....	....	.....
7747	North-east	41	7	1,138.5	72	42	801.5
	South-east	41	6	974.0	72	42	802.5
	South-west	41	6	974.0	72	44	11.0
	North-west	41	7	1,138.5	72	44	10.0
7748	North-east	41	7	1,138.5	72	41	193.0
	South-east	41	6	974.0	72	41	194.0
	South-west	41	6	974.0	72	42	802.5
	North-west	41	7	1,138.5	72	42	801.5

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.—(*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
7749	North-east	41	7	1,138.5	72	39	984.5
	South-east	41	6	974.0	72	39	985.5
	South-west	41	6	974.0	72	41	194.0
	North-west	41	7	1,138.5	72	41	193.0
7750	North-east	41	7	1,138.5	72	38	376.0
	South-east	41	6	974.0	72	38	377.0
	South-west	41	6	974.0	72	39	985.5
	North-west	41	7	1,138.5	72	39	984.5
7751	North-east	41	7	1,138.5	72	36	1,167.0
	South-east	41	6	974.0	72	36	1,168.5
	South-west	41	6	974.0	72	38	377.0
	North-west	41	7	1,138.5	72	38	376.0
7752	North-east	41	7	1,138.5	72	35	559.0
	South-east	41	6	974.0	72	35	560.0
	South-west	41	6	974.0	72	36	1,168.5
	North-west	41	7	1,138.5	72	36	1,167.0
7753	North-east	41	7	1,138.5	72	33	1,350.0
	South-east	41	6	974.0	72	33	1,351.5
	South-west	41	6	974.0	72	35	560.0
	North-west	41	7	1,138.5	72	35	559.0
7754	North-east	41	7	1,138.5	72	32	742.0
	South-east	41	6	974.0	72	32	743.0
	South-west	41	6	974.0	72	33	1,351.5
	North-west	41	7	1,138.5	72	33	1,350.0
7755	North-east	41	7	1,138.5	72	31	133.5
	South-east	41	6	974.0	72	31	134.5
	South-west	41	6	974.0	72	32	743.0
	North-west	41	7	1,138.5	72	32	742.0
7756	North-east	41	7	1,138.5	72	29	925.0
	South-east	41	6	974.0	72	29	926.0
	South-west	41	6	974.0	72	31	134.5
	North-west	41	7	1,138.5	72	31	133.5
7757	North-east	41	7	1,138.5	72	28	317.0
	South-east	41	6	974.0	72	28	318.0
	South-west	41	6	974.0	72	29	926.0
	North-west	41	7	1,138.5	72	29	925.0
7758	North-east	41	7	1,138.5	72	26	1,108.0
	South-east	41	6	974.0	72	26	1,109.5
	South-west	41	6	974.0	72	28	318.0
	North-west	41	7	1,138.5	72	28	317.0
7759	North-east	41	7	1,138.5	72	25	499.5
	South-east	41	6	974.0	72	25	500.5
	South-west	41	6	974.0	72	26	1,109.5
	North-west	41	7	1,138.5	72	26	1,108.0
7760	North-east	41	7	1,138.5	72	23	1,291.0
	South-east	41	6	974.0	72	23	1,292.5
	South-west	41	6	974.0	72	25	500.5
	North-west	41	7	1,138.5	72	25	499.5
7761	North-east	41	7	1,138.5	72	22	682.5
	South-east	41	6	974.0	72	22	684.0
	South-west	41	6	974.0	72	23	1,292.5
	North-west	41	7	1,138.5	72	23	1,291.0
8847	North-east	....	....	.....	....	...	.....
	South-east	41	7	1,138.5	72	42	801.5
	South-west	41	7	1,138.5	72	44	10.0
	North-west	....	....	.....	....	....	.....

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC. — (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
8848	North-east	....	....	.....	....	....	.....
	South-east	41	7	1,138.5	72	41	193.0
	South-west	41	7	1,138.5	72	42	801.5
	North-west	....	....	.....	....	....	.....
8849	North-east	41	8	1,303.5	72	39	963.5
	South-east	41	7	1,138.5	72	39	964.5
	South-west	41	7	1,138.5	72	41	193.0
	North-west	....	....	.....	....	....	.....
8850	North-east	41	8	1,303.5	72	38	375.0
	South-east	41	7	1,138.5	72	38	376.0
	South-west	41	7	1,138.5	72	39	964.5
	North-west	41	8	1,303.5	72	39	963.5
8851	North-east	41	8	1,303.5	72	36	1,166.0
	South-east	41	7	1,138.5	72	36	1,167.0
	South-west	41	7	1,138.5	72	38	376.0
	North-west	41	8	1,303.5	72	38	375.0
8852	North-east	41	8	1,303.5	72	35	558.0
	South-east	41	7	1,138.5	72	35	559.0
	South-west	41	7	1,138.5	72	36	1,167.0
	North-west	41	8	1,303.5	72	36	1,166.0
8853	North-east	41	8	1,303.5	72	33	1,349.0
	South-east	41	7	1,138.5	72	34	1,350.0
	South-west	41	7	1,138.5	72	35	559.0
	North-west	41	8	1,303.5	72	35	558.0
8854	North-east	41	8	1,303.5	72	32	741.0
	South-east	41	7	1,138.5	72	32	742.0
	South-west	41	7	1,138.5	72	33	1,350.0
	North-west	41	8	1,303.5	72	33	1,349.0
8855	North-east	41	8	1,303.5	72	31	132.5
	South-east	41	7	1,138.5	72	31	133.5
	South-west	41	7	1,138.5	72	32	742.0
	North-west	41	8	1,303.5	72	32	741.0
8856	North-east	41	8	1,303.5	72	29	924.0
	South-east	41	7	1,138.5	72	29	925.0
	South-west	41	7	1,138.5	72	31	133.5
	North-west	41	8	1,303.5	72	31	132.5
8857	North-east	41	8	1,303.5	72	28	316.0
	South-east	41	7	1,138.5	72	28	317.0
	South-west	41	7	1,138.5	72	29	925.0
	North-west	41	8	1,303.5	72	29	924.0
8858	North-east	41	8	1,303.5	72	26	1,106.5
	South-east	41	7	1,138.5	72	26	1,106.0
	South-west	41	7	1,138.5	72	28	317.0
	North-west	41	8	1,303.5	72	28	316.0
8859	North-east	41	8	1,303.5	72	25	498.5
	South-east	41	7	1,138.5	72	25	499.5
	South-west	41	7	1,138.5	72	26	1,106.0
	North-west	41	8	1,303.5	72	26	1,106.5
8860	North-east	41	8	1,303.5	72	23	1,289.5
	South-east	41	7	1,138.5	72	23	1,291.0
	South-west	41	7	1,138.5	72	25	499.5
	North-west	41	8	1,303.5	72	25	498.5
8861	North-east	41	8	1303.5	72	22	681.0
	South-east	41	7	1138.5	72	22	682.5
	South-west	41	7	1138.5	72	23	1291.0
	North-west	41	8	1303.5	72	23	1289.5

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC. — (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
8862	North-east	41	8	1,303.5	72	21	73.0
	South-east	41	7	1,138.5	72	21	74.0
	South-west	41	7	1,138.5	72	21	682.5
	North-west	41	8	1,303.5	72	22	681.0
9951	North-east	....	....	.....	....	....	.....
	South-east	41	8	1,303.5	72	36	1,166.0
	South-west	41	8	1,303.5	72	38	375.0
	North-west	....	....	.....	....	....	.....
9952	North-east	....	....	.....	....	....	.....
	South-east	41	8	1,303.5	72	35	558.0
	South-west	41	8	1,303.5	72	36	1,166.0
	North-west	....	....	.....	....	....	.....
9953	North-east	41	9	1,468.5	72	33	1,348.0
	South-east	41	8	1,303.5	72	33	1,349.0
	South-west	41	8	1,303.5	72	35	558.0
	North-west	....	....	.....	....	....	.....
9954	North-east	41	9	1,468.5	72	32	740.0
	South-east	41	8	1,303.5	72	32	741.0
	South-west	41	8	1,303.5	72	33	1,349.0
	North-west	41	9	1,468.5	72	33	1,348.0
9955	North-east	41	9	1,468.5	72	31	132.0
	South-east	41	8	1,303.5	72	31	132.5
	South-west	41	8	1,303.5	72	32	741.0
	North-west	41	9	1,468.5	72	32	740.0
9956	North-east	41	9	1,468.5	72	29	923.0
	South-east	41	8	1,303.5	72	29	924.0
	South-west	41	8	1,303.5	72	31	132.5
	North-west	41	9	1,468.5	72	31	132.0
9957	North-east	41	9	1,468.5	72	28	315.0
	South-east	41	8	1,303.5	72	28	316.0
	South-west	41	8	1,303.5	72	29	924.0
	North-west	41	9	1,468.5	72	29	923.0
9958	North-east	41	9	1,468.5	72	26	1,105.5
	South-east	41	8	1,303.5	72	26	1,106.5
	South-west	41	8	1,304.5	72	28	316.0
	North-west	41	9	1,468.5	72	28	315.0
9959	North-east	41	9	1,468.5	72	25	497.5
	South-east	41	8	1,303.5	72	25	498.5
	South-west	41	8	1,303.5	72	26	1,106.5
	North-west	41	9	1,468.5	72	26	1,105.5
9960	North-east	41	9	1,468.5	72	23	1,288.5
	South-east	41	8	1,303.5	72	23	1,289.5
	South-west	41	8	1,303.5	72	25	498.5
	North-west	41	9	1,468.5	72	25	497.5
9961	North-east	41	9	1,468.5	72	22	680.0
	South-east	41	8	1,303.5	72	22	681.0
	South-west	41	8	1,303.5	72	23	1,289.5
	North-west	41	9	1,468.5	72	23	1,288.5
9962	North-east	41	9	1,468.5	72	21	72.5
	South-east	41	8	1,303.5	72	21	73.0
	South-west	41	8	1,303.5	72	22	681.0
	North-west	41	9	1,468.5	72	22	680.0
9963	North-east	41	9	1,468.5	72	19	863.0
	South-east	41	8	1,303.5	72	19	864.0
	South-west	41	8	1,303.5	72	21	73.0
	North-west	41	9	1,468.5	72	21	72.5

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC.— (*Continued*).

Township.	CORNER.	Latitude (North).			Longitude (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
9964	North-east	41	9	1,468.5	72	18	255.0
	South-east	41	8	1,303.5	72	18	256.0
	South-west	41	8	1,303.5	72	19	864.0
	North-west	41	9	1,468.5	72	19	863.0
9965	North-east	41	9	1,468.5	72	16	1,046.0
	South-east	41	8	1,303.5	72	16	1,047.0
	South-west	41	8	1,303.5	72	18	256.0
	North-west	41	9	1,468.5	72	18	255.0
11155	North-east	....	....	.....	....	....	.....
	South-east	41	9	1,468.5	72	31	132.0
	South-west	41	9	1,468.5	72	32	240.0
	North-west	....	....	.....	....	....	.....
11156	North-east	....	....	.....	....	....	.....
	South-east	41	9	1,468.5	72	29	923.0
	South-west	41	9	1,468.5	72	31	132.0
	North-west	....	....	.....	....	....	.....
11157	North-east	41	10	1,634.5	72	28	314.0
	South-east	41	9	1,468.5	72	28	315.0
	South-west	41	9	1,468.5	72	29	923.0
	North-west	41	10	1,634.5	72	29	.....
11158	North-east	41	10	1,634.5	72	26	1,104.5
	South-east	41	9	1,468.5	72	26	1,105.5
	South-west	41	9	1,468.5	72	28	315.0
	North-west	41	10	1,634.5	72	28	314.0
11159	North-east	41	10	1,634.5	72	25	496.5
	South-east	41	9	1,468.5	72	25	497.5
	South-west	41	9	1,468.5	72	26	1,105.5
	North-west	41	10	1,634.5	72	26	1,104.5
11160	North-east	41	10	1,634.5	72	23	1,287.0
	South-east	41	9	1,468.5	72	23	1,288.5
	South-west	41	9	1,468.5	72	25	497.5
	North-west	41	10	1,634.5	72	25	496.5
11161	North-east	41	10	1,634.5	72	22	679.0
	South-east	41	9	1,468.5	72	22	680.0
	South-west	41	9	1,468.5	72	23	1,288.5
	North-west	41	10	1,634.5	72	23	1,287.0
11162	North-east	41	10	1,634.5	72	21	71.0
	South-east	41	9	1,468.5	72	21	72.5
	South-west	41	9	1,468.5	72	22	680.0
	North-west	41	10	1,634.5	72	22	679.0
11163	North-east	41	10	1,634.5	72	19	862.0
	South-east	41	9	1,468.5	72	19	863.0
	South-west	41	9	1,468.5	72	21	72.5
	North-west	41	10	1,634.5	72	21	71.0
11164	North-east	41	10	1,634.5	72	18	254.0
	South-east	41	9	1,468.5	72	18	255.0
	South-west	41	9	1,468.5	72	19	863.0
	North-west	41	10	1,634.5	72	19	862.0
11165	North-east	41	10	1,634.5	72	16	1,044.5
	South-east	41	9	1,468.5	72	16	1,046.0
	South-west	41	9	1,468.5	72	18	255.0
	North-west	41	10	1,634.5	72	18	254.0
11166	North-east	41	10	1,634.5	72	15	437.0
	South-east	41	9	1,468.5	72	15	438.0
	South-west	41	9	1,468.5	72	16	1,046.0
	North-west	41	10	1,634.5	72	16	1,044.5

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC. — (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
11167	North-east	41	10	1,634.5	72	13	1,227.0
	South-east	41	9	1,468.5	72	13	1,228.5
	South-west	41	9	1,468.5	72	15	438.0
	North-west	41	10	1,634.5	72	15	437.0
11168	North-east	41	10	1,634.5	72	12	619.5
	South-east	41	9	1,468.5	72	12	621.0
	South-west	41	9	1,468.5	72	13	1,228.5
	North-west	41	10	1,634.5	72	13	1,227.0
11169	North-east	41	10	1,634.5	72	11	11.5
	South-east	....	....	.....	....	....	.....
	South-west	41	9	1,468.5	72	12	621.0
	North-west	41	10	1,634.5	72	12	619.5
22358	North-east	....	....	.....	....	....	.....
	South-east	41	10	1,634.5	72	26	1,104.5
	South-west	41	10	1,634.5	72	28	314.0
	North-west	....	....	.....	....	....	.....
22359	North-east	....	....	.....	....	....	.....
	South-east	41	10	1,634.5	72	25	496.5
	South-west	41	10	1,634.5	72	26	1,104.5
	North-west	...	....	.....	....	....	.....
22360	North-east	....	....	.....	....	....	.....
	South-east	41	10	1,634.5	72	23	1,287.0
	South-west	41	10	1,634.5	72	25	496.5
	North-west	....	....	.....	....	....	.....
22361	North-east	41	11	1,801.0	72	22	678.0
	South-east	41	10	1,634.5	72	22	679.0
	South-west	41	10	1,634.5	72	23	1,287.0
	North-west	....	....	.....	....	....	.....
22362	North-east	41	11	1,801.0	72	21	70.0
	South-east	41	10	1,634.5	72	21	71.0
	South-west	41	10	1,634.5	72	22	679.0
	North-west	41	11	1,801.0	72	22	678.0
22363	North-east	41	11	1,801.0	72	19	860.5
	South-east	41	10	1,634.5	72	19	862.0
	South-west	41	10	1,634.5	72	21	71.0
	North-west	41	11	1,801.0	72	21	70.0
22364	North-east	41	11	1,801.0	72	18	253.0
	South-east	41	10	1,634.5	72	18	254.0
	South-west	41	10	1,634.5	72	19	862.0
	North-west	41	11	1,801.0	72	19	860.5
22365	North-east	41	11	1,801.0	72	16	1,043.0
	South-east	41	10	1,634.5	72	16	1,044.5
	South-west	41	10	1,634.5	72	18	254.0
	North-west	41	11	1,801.0	72	18	253.0
22366	North-east	41	11	1,801.0	72	15	437.5
	South-east	41	10	1,634.5	72	15	437.0
	South-west	41	10	1,634.5	72	16	1,044.5
	North-west	41	11	1,801.0	72	16	1,043.0
22367	North-east	41	11	1,801.0	72	13	1,225.5
	South-east	41	10	1,634.5	72	13	1,227.0
	South-west	41	10	1,634.5	72	15	437.0
	North-west	41	11	1,801.0	72	15	435.5
22368	North-east	41	11	1,801.0	72	12	618.0
	South-east	41	10	1,634.5	72	12	619.5
	South-west	41	10	1,634.5	72	13	1,227.0
	North-west	41	11	1,801.0	72	13	1,225.5

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC. — (*Continued*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
33359	North-east	41	11	1,801.0	72	11	10.0
	South-east	41	10	1,634.5	72	11	11.5
	South-west	41	10	1,634.5	72	12	619.5
	North-west	41	11	1,801.0	72	12	618.5
33362	North-east	....	....	.....	....	....	.....
	South-east	41	11	1,801.0	72	21	70.0
	South-west	41	11	1,081.0	72	22	678.0
	North-west	....	....	.....	....	....	.....
33363	North-east	....	....	.....	....	....	.....
	South-east	41	11	1,801.0	72	19	860.5
	South-west	41	11	1,801.0	72	21	70.0
	North-west	....	....	.....	....	....	.....
33364	North-east	....	....	.....	....	....	.....
	South-east	41	11	1,801.0	72	18	253.0
	South-west	41	11	1,801.0	72	19	860.5
	North-west	....	....	.....	....	....	.....
33365	North-east	41	13	117.0	72	16	1,041.5
	South-east	41	11	1,801.0	72	16	1,043.0
	South-west	41	11	1,801.0	72	18	253.0
	North-west	....	....	.....	....	....	.....
33366	North-east	41	13	117.0	72	15	434.0
	South-east	41	11	1,801.0	72	15	435.5
	South-west	41	11	1,801.0	72	16	1,043.0
	North-west	41	13	117.0	72	16	1,041.5
33367	North-east	41	13	117.0	72	13	1,224.0
	South-east	41	11	1,801.0	72	13	1,225.5
	South-west	41	11	1,801.0	72	15	435.5
	North-west	41	13	117.0	72	15	434.0
33368	North-east	41	13	117.0	72	12	616.5
	South-east	41	11	1,801.0	72	12	618.0
	South-west	41	11	1,801.0	72	13	1,225.5
	North-west	41	13	117.0	72	13	1,224.0
33369	North-east	41	13	117.0	72	11	9.0
	South-east	41	11	1,801.0	72	11	10.0
	South-west	41	11	1,801.0	72	12	618.0
	North-west	41	13	117.0	72	12	616.5
33370	North-east	41	13	117.0	72	12	799.0
	South-east	41	11	1,801.0	72	9	800.5
	South-west	41	11	1,801.0	72	11	10.0
	North-west	41	13	117.0	72	11	9.0
33371	North-east	41	13	117.0	72	8	191.5
	South-east	41	11	1,801.0	72	8	193.0
	South-west	41	11	1,801.0	72	9	800.5
	North-west	41	13	117.0	72	9	799.0
33372	North-east	41	13	117.0	72	6	961.5
	South-east	41	11	1,801.0	72	6	963.0
	South-west	41	11	1,801.0	72	8	193.0
	North-west	41	13	117.0	72	8	191.5
33373	North-east	41	13	117.0	72	5	374.0
	South-east	41	11	1,801.0	72	5	375.0
	South-west	41	11	1,801.0	72	6	963.0
	North-west	41	13	117.0	72	6	961.5
44466	North-east	....	....	.....	....	....	.....
	South-east	41	13	117.0	72	15	434.0
	South-west	41	13	117.0	72	16	1,041.5
	North-west	....	....	.....	....	....	.....

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GEOGRAPHICAL POSITIONS OF THE TOWNSHIPS, ETC. — (*Concluded*).

Township.	CORNER.	LATITUDE (North).			LONGITUDE (West).		
		Degrees.	Minutes.	Metres.	Degrees.	Minutes.	Metres.
44467	North-east	....	....	.....	....	....	.....
	South-east	41	13	117.0	72	13	1,224.0
	South-west	41	13	117.0	72	15	434.0
	North-west	....	....	.....	...	....	.....
44468	North-east	....	....	.....	....	....	.....
	South-east	41	13	117.0	72	12	616.5
	South-west	41	13	117.0	72	13	1,224.0
	North-west	....	....	.....	....	....	.....
44469	North-east	41	14	285.0	72	11	8.0
	South-east	41	13	117.0	72	11	9.0
	South-west	41	13	117.0	72	12	616.5
	North-west	41	14	285.0	72	12	.....
44470	North-east	41	14	285.0	72	9	798.0
	South-east	41	13	117.0	72	9	799.0
	South-west	41	13	117.0	72	11	9.0
	North-west	41	14	285.0	72	11	8.0
44471	North-east	41	14	285.0	72	8	190.5
	South-east	41	13	117.0	72	8	191.5
	South-west	41	13	117.0	72	9	799.0
	North-west	41	14	285.0	72	9	798.0
44472	North-east	41	14	285.0	72	6	980.5
	South-east	41	13	117.0	72	6	981.5
	South-west	41	13	117.0	72	8	191.5
	North-west	41	14	285.0	72	8	190.5
44473	North-east	41	14	285.0	72	5	373.0
	South-east	41	13	117.0	72	5	374.0
	South-west	41	13	117.0	72	6	981.5
	North-west	41	14	285.0	72	6	980.5
55570	North-east	....	....	.....	....	....	.....
	South-east	41	14	285.0	72	9	798.0
	South-west	41	14	285.0	72	11	8.0
	North-west	....	....	.....	....	....	.....
55571	North-east	....	....	.....	....	....	.....
	South-east	41	14	285.0	72	8	190.5
	South-west	41	14	285.0	72	9	798.0
	North-west	....	....	.....	....	....	.....
55572	North-east	....	....	.....	....	....	.....
	South-east	41	14	285.0	72	6	980.5
	South-west	41	14	285.0	72	8	190.5
	North-west	....	....	.....	....	....	.....
55573	North-east	....	....	.....	....	....	.....
	South-east	41	14	285.0	72	5	373.0
	South-west	41	14	285.0	72	6	980.5
	North-west	....	....	.....	....	....	.....

During the winter I have had visits from a large number of oystermen who came to get information regarding the character of different lands, as to the position of natural growth beds, requirements of the laws, etc., and I have found the number of applicants for such information to be upon the increase.

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The first part of May I sent fifty-seven copies of the following notice to as many newspapers:

To the editor of .....

DEAR SIR.—I have the honor to inclose you a copy of the Oyster Law of 1887.

It affects an important industry, and is, in consequence, of interest to a large number of your readers. Particular attention should be called to the latter part of section 1, which refers to lands occupied already. Within about a month the time therein mentioned will have expired.

I think it possible there are oystermen who have not kept themselves posted on the laws effecting their interests and that through ignorance they may fail to take advantage of the opportunities afforded them.

I have no State funds at my disposal to pay for notices in the papers, or else would have them printed.

I have thought that your interest in the welfare of so large a number of your readers might cause you to allot enough of your space to the publication of this law purely out of public spirit.

Blank forms for applications for franchises can be had by writing to the clerk of the New York Fish Commission, 38 Park Row, New York city.

Very respectfully.

EUGENE G. BLACKFORD,
Shell Fish Commissioner.

At the same time we wrote to Mr. F. M. Thorn, the Superintendent of the Coast Survey, and asked him if he would allow us the use of one of the government vessels at the navy yard for the summer, agreeing on our part to take good care of her and keep her in repair. We were most courteously granted the permission, and, through the kindness of Lieutenant-Commander W. H. Bronson, United States Navy, Hydrographic Inspector, the schooner Palinurus was placed at our disposal and every facility consistent with workings of his department was most cordially tendered us.

The very day our request was granted I took steps to ship the crew and get the vessel in order.

She was rigged and equipped while at the navy yard, and then taken to dry-dock in New York and hauled out to be assured she was in good condition.

We were towed through Hell Gate on the twenty-eighth, anchoring in Little Neck bay that afternoon, where our first field-work of the

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season was to commence. Throughout the entire year I have been assisted in the engineering work by Mr. N. I. Ovigstad. I have been very much pleased with the care and accuracy displayed by him in taking angles, by his familiarity with all parts of the work and by his attention to duty generally. During the past summer he has surveyed a large number of lots unaided and I have not discovered a single error.

Finishing the work in this bay we proceeded to Wooley's cove and then to Fox island. The plan for each day was laid out in advance, including Decoration Day. Since the holidays came in the middle of the week I carried on operations during them and gave the men their days off at the end of the first convenient week following, to save the time necessary to run to and from a harbor in the sound.

Several large tracts were surveyed in the vicinity of Matinicock point, Peacock point, Fox island and Oak Neck point.

During this time a claim was put in for a tract of land which ran directly across a natural growth bed, and much pressure was brought to bear to prove the findings of the Fishery Commission to be incorrect. From the very first I informed these people that they could not lawfully obtain possession of this ground.

It lay between Fox island and Matinicock point. Between these extremes there is another small cape called Peacock point, with bights on either side.

The applicants brought affidavits from a number of oystermen, in which the latter swore they had planted for a long term of years the ground between Fox island and Matinicock point, that there had never been any natural growth there, but that the set which is to be found at any time is artificial and had been brought into existence through the efforts of these men who had expended much labor and money in depositing culch, spawners, etc.

Moreover, these men gave assignments for considerations of their claims to these lands to the persons who were now applying for them.

For a time they appeared to have a clear case. The oystermen are very jealous of their interests, and popular opinion, when aroused, soon takes the form of earnest and decided expressions.

Upon the other hand, it is often a matter of surprise to see how careless they are of their interests, generally for want of concerted action. I suppose what is everybody's business is nobody's with oystermen as well as others.

While lying in Peacock bend one day I was just about to start out to work when I noticed a small fleet of oyster sloops bearing down upon us with all sail set and the foam dashing around their cutwaters.

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Moreover, they soon rounded to and anchored nearby. Nearly thirty oystermen came aboard to express their opinions as to the merits of the claim of the people of whom I have just spoken and to protest against any grant being made.

They were very emphatic in their denunciation of the "scheme," as they called it, and gave statements to disprove the affidavits which had been made as to the former cultivation of this land.

As in most cases, however, their zeal led them to claim too much for their side — the opposition — and they held that the whole of Peacock bend was also natural growth and that a man could make a good living from any part of it.

A most potent argument in such cases is a visual proof, so I suggested, as they claimed to know the ground thoroughly, they should prove by actions instead of words the strength of their arguments. They conceded to the plan and in a short time we were making a number of hauls in different parts of the bend.

Did they succeed they would prove the investigation of the commission to be inadequate. I must say, though, that however interesting the examination was I could not help watching it with a good deal of complacency, holding in reserve a mental "I told you so" at each haul of the dredge. They made splendid hauls — of star-fish, but nothing else — until they ran near Peacock point and into the limits of the areas designated by us as natural growth.

Their visit was not without value however, and it convinced me that there was something materially wrong about these affidavits.

Upon reporting the case to the Shell Fish Commissioner, I was directed to invite all the men interested in the preservation of the natural beds to be present at a hearing to be given both sides two weeks later.

I was also told that since the claim of the plaintiffs was toward refuting the accuracy of my former work that I should take the role of defendant.

Accordingly, I had notices published in the local newspapers giving full information as to the date of meeting, etc.

To be sure of a thorough understanding I visited Glen Cove the evening before the meeting and here is an example of what I have spoken but a short way back. Scarcely anyone seemed to know who was going to the meeting from that town. In fact, no one was going. Suppressing for the moment a feeling of indignation which arose from a sense of being imposed upon, I went to the individual houses of many of the men and expressed quite freely my opinion of their actions in having made an appeal to me to represent their grievances before the

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commission, while they were too inert to be present at the meeting and express their reasons for making this appeal.

It was for their benefit that the proposed steps were to be taken and yet they were failing to come to the front at the critical moment. They realized at once the force of the argument and expressed their appreciation of the trouble taken in their behalf.

The next day the office of the Fish Commission was packed with oystermen and the corridors were filled for some distance on either side of the door.

The evidence given by these men corroborated my former investigations, but the claimants of the ground clung to the sworn testimony of the men who claimed to have had the land in cultivation.

In the meantime I had run across what was either a great piece of carelessness or a very sharp and shrewd trick. It was this, the names upon the affidavits representing men who swore to having cultivated the lands between Fox island and Matinicock point included several who had only planted between Peacock point and Matinicock point. The former limits include the latter.

Geometrically the statements were true, but they gave a radically wrong impression, to wit: that they had also planted between Fox island and Peacock point. Moreover, the places in which they had planted and for which they had given their quit-claim deeds to applicants, were not included in the ground applied for. Whether this was intentional or not, the application for natural growth ground was not granted and the laws of the State were rigidly enforced.

From here we went to Lloyd's Neck and surveyed most of the ground to the northward to nine and ten fathoms of water.

Having been informed from various sources that the Eaton's Neck natural growth bed had materially increased in size since the last survey of it, I reported the fact to the Shell Fish Commissioner and by his direction proceeded to make additional examinations.

We dredged over different parts of the bed from a steamer and made a large number of hauls, fixing the length and position of each haul by sextant angles. In addition to this we had notices published in local papers, in which invitation was extended to all oystermen interested to be present during an examination and to give any information or suggestion as to its limits. It was suggested that meetings of oystermen to be held in different localities and members be sent to form a committee to represent the natural growth interest.

A committee was sent and a final examination was made which proved eminently satisfactory to all present.

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The size of the plot reserved was increased and the final decision of the Shell Fish Commissioner was that it should be included in the following:

Lots 58, 59, 60, 68, 69, 70, 78, 79, 80, 88, 89, 90, 98, 99, 100; township, 917.

Lots 8, 9, 10, 18, 19, 20, 28, 29, 30, 38, 39, 40, 48, 49, 50; township, 817.

All of section C. Township 918.

All of section D. Township 818.

Area, 800 acres.

After the first examination of Easton's Neck bed we ran to the eastward and surveyed a large number of oyster lots extending from there to Crane's Neck, almost continuously.

We found the blizzard of last winter had carried away several of our signals and these had to be replaced.

Notably was the St. Johnland flag-pole. It had been snapped at the base and was not to be seen many feet away.

Its position is a commanding one and is the most important signal for miles.

It is upon the top of a high hill but is surrounded by trees for a long distance. A structure had to be erected here and it had to be of sufficient height to show above the foliage. The one we constructed was four-sided and capped with a central pole. Its total height is about forty feet, but it shows like a church steeple.

While at anchor in Smithtown bay some one pointed out a couple of oyster sloops dredging over cultivated ground upon which they had no right.

I watched them through the glasses making haul after haul and dumping the oysters they had caught upon their decks. It was a clear case of robbery, and I made up my mind to do what I could to bring the offenders to justice.

One of the great difficulties in prosecuting such cases is to prove upon whose ground the thieves were doing their stealing. It is not like catching a thief on land. There you can run up and grab him. Here he is necessarily a good way off, for he has an open field of vision and the moment he sees anyone coming he hoists his jib and skips. The distances upon the water are very deceptive, and without instruments a position is hard to determine.

But by taking a few quick angles with a couple of sextants, the position of each vessel can be determined to a foot.

My scheme was to head the sloops off by sending out two boats and two crews, but while I was in the act of lowering the boats, the sloops

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filled away and stood to the westward, lying well to windward of us and dashing along under a good stiff breeze.

There was no possibility of our overtaking them with our boats and there was not time to commence chase with the schooner.

About two miles to the westward was a small steamer bound east and coming directly for us.

Manning one boat, I had the men pull quickly in that direction, and meeting her we ran alongside and jumped aboard.

After a few hurrid words of explanation to the captain, he kindly placed his vessel at my disposal and we gave chase. The sloops had something of a start upon us by this time, but we kept well to leeward of them until near enough to be certain of getting them. Seeing they were caught they rounded to and came to anchor.

I got all the information necessary and sent word to the owners of the ground from which they were stealing that I would appear in court officially if they wished to prosecute.

These fellows were caught stealing oysters while in Connecticut waters shortly afterwards and were incarcerated before our people had gotten their papers ready.

After finishing the work in Smithtown bay we worked back to the westward, surveying all the lands applied for which had been left out owing to the failure of the applicants to appear at the time allotted to them but who were able to join me later.

In connection with this I may say that it is by no means an easy task to so arrange dates that a plan of work may be carried out over a field covering distances of over fifty miles, when one day of bad weather will break the continuity and several days of it may necessitate an entire change of base.

A number of men were unable to meet appointments owing to circumstances not entirely within their control, but the demand for work in Raritan bay became so great that we were obliged to leave the Sound the latter part of July and attend to it.

The amount of work in Raritan bay must be inspected in order to be realized.

Think of miles of water covering oyster beds of various sizes from half an acre in area upward. A half an acre is contained in a square of sides less than fifty yards in length.

The first thing we had to do here was to inspect the chain of signals to see they were intact and to repair those dilapidated. The blizzard had created some havoc here, but its mischief was by no means so serious as that caused by someone in not only tearing down the wood-work of the signals but in digging up both surface and sub-

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surface marks. I could not find any clue to the culprits. It is by no means an uncommon trick. The experience of engineers along our whole Atlantic coast shows that this thing will occur. It is either done out of spite to mankind or by practical jokers who revel in the idea of the inconvenience they can cause by their little frolic. There is only one thing to be done in such cases and that is to build and determine new signals.

It seemed too bad to have to stop the surveying of lots in order to run in a new triangulation, and I determined not to do it if possible. So I built the signals first and trusted to luck to a certain degree.

We received every applicant as he came, surveyed his property, ran back and got the next and so on, using the undetermined signals right along as though their geographical positions were known to a fraction of an inch.

Then during the lulls we ran ashore, set up our instruments and took observations, etc., until a signal from the vessel showed some one to be waiting for us.

The work verified beautifully and we had no cause for regret but every reason to congratulate ourselves that we had allowed for the time being an element of chance to enter into our plans.

The rush for work in this bay was often trying. I had to keep my memorandum book filled with engagements throughout the season from a week to ten days ahead, and along toward the last was obliged to decline making any more at all.

We increased our force by engaging two recorders, and, notwithstanding our running two separate surveying parties, we were unable to keep up with the demand.

The greatest bugbear in our work was the problem of covering distances. The vessel was anchored as near the middle of the ground as possible and we endeavored to work both ways.

The majority of planters in this bay own several lots situated in different places.

Suppose a man owns six lots, which is by no means an uncommon thing. The probabilities are that the total distance between extreme lots is several miles, often as many as six.

If we made appointments to do work only in one locality at a time this man would have to come six times. Each visit would take up most of his day and it would take a whole week for him to attend the survey of his property, while by adhering to him, all his work would be done in one day. Some own as many as twenty lots.

Apart from the difficulty getting the number of men living perhaps miles apart to meet at a given hour of a given day upon a certain spot

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in a large bay, it would be manifestly unjust to insist upon a man coming at one's beck and call in such a way as to cause him the loss of several days of his probably valuable time.

So we finished for each man as far as possible all his work the same day. On the other hand it required on our part in many cases having the men row from a dozen to eighteen miles a day in addition to their other work.

A steam launch can not be used to advantage in this work.

If of sufficient stability to stand the sea in rough weather, as for instance in even a fresh southeast breeze it is too unwieldy to handle quickly and it is almost impossible to keep it near the stakes or to prevent pulling them up.

There were a few cases of disputed territory, but I have no doubt of being able to adjust them satisfactorily to all parties concerned.

It sometimes happened that some of the oystermen failed to keep appointments and it would be too late to make new ones for that time. In such cases I had a basket hoisted at the fore-topmast head and put the time into office work until some one should come along to fill in the time left vacant unexpectedly.

The basket meant that anyone that came along at the time could be attended to.

During the summer we surveyed some 350 oyster lots, covering a distance apart of seventy-two miles, besides the other work of which I have spoken. It was more than I had hoped to accomplish in the short time for which our appropriation allowed field-work.

As a matter of business it would be better for the State if a larger appropriation were made each year. An additional month of field-work would bring about better results than could be had during any of the preceding ones. The reason is manifest. We do our best work at the latter part of each season.

In producing a manufactured article the great cost is in establishing the plant. When once in running order the maintenance is comparatively small. It is the same in the equipment of a surveying party. Moreover, at the beginning of a season the engineer has to instruct the men in what is required of them. He must keep his attention upon every detail. He must note the stroke of the men in the boat or the trim of the sail, watch the changes of ranges, keep an eye upon the signals upon shore, explain to the owner of the lot what is required of him, see that he gives his information correctly, see that the recorders get it in the record books in a proper manner, take the angles necessary and a number of other things, such as making allow-

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ance for tides, looking out for change of weather, etc., to an extent readily tending to confuse a novice.

As the time goes on the crew absorb the requirements of the situation, they look more to the guidance of the boat, they know what is coming next and prepare for it, thus relieving the engineer of much brain work, and he on his hand being helped in this manner has greater capabilities for doing his individual duties with greater rapidity. There is a knack in this kind of work and it tells very plainly in the latter part of the season.

We laid the vessel up in the navy yard the middle of September, turned her over to the proper authorities, discharged the crew and commenced office work.

There is on hand a large amount of office work, including the plotting of 300 oyster lots, including several thousand acres of ground, preparing the applications for the same, making out the mathematical descriptions of franchises, etc., as explained in an earlier part of the report.

The two small patches of ground indicated as natural growth beds Nos. 11 and 16 have been found upon investigation to be simply sporadic collections of set, upon nuclei thrown overboard by culturists, and have been thrown open to cultivation.

The following is a summary of the expenditures of this department during the past year:

Salary and pay of crew	$3,790 82
Stationery, maps, drawing materials, printing, etc	241 35
Field expenses	753 57
Office expenses	304 87
Miscellaneous	5 85
Total	$5,096 46

Very respectfully.

WILLIAM G. FORD, Jr.,
Engineer.

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CLERK'S REPORT.

To the Commissioners of Fisheries, State of New York:

GENTLEMEN.—I have the honor to present herewith the work of the Shell Fish Department for the year ending November 30, 1888.

There have been received 471 applications for grants of land under water for purposes of shell-fish cultivation, of which 153 have been granted. One hundred and fifty grants have been issued, for which $2,039 have been collected.

As many of the applications were for more than one lot, there still remains a large number of franchises to be issued. A list of the applications granted is attached hereto. A number of important questions as to character of land and jurisdiction have been settled, fuller references to which will be found in the report of the engineer. A number of assignments of title, as provided by law, have been made and the oystermen generally express great satisfaction with the security of tenure now afforded them.

During the coming year it is believed the number of applications will be largely increased, and the department being now thoroughly organized much more work will be done.

Respectfully.

EDWARD P. DOYLE,
Clerk.

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CLERK'S REPORT.

Number.	NAME.	Location.	Action of commissioners.
1	Hiram Monsell	Long Island sound.	Sold August 6, 1888.
3	E. P. Manee	Raritan bay	Granted November 7, 1887.
4	James H. Merrill	Raritan bay	Partially granted November 7, 1887.
21	James H. Wood	Raritan bay	Granted January 4, 1888.
22	S. B. Sprague	Raritan bay	Granted January 4, 1888.
23	Jacob I. Houseman	Raritan bay	Granted January 4, 1888.
24	Wernant W. Wise	Raritan bay	Partially granted August 6, 1888.
28	T. F. & S. D. De Hart	Raritan bay	Granted January 4, 1888.
29	Egbert Brush	Smithtown bay	Granted January 4, 1888.
30	James Primrose	Smithtown bay	Granted January 4, 1888.
31	William H. Turman	Smithtown bay	Granted January 4, 1888.
32	George A. Smith	Smithtown bay	Granted January 4, 1888.
33	William G. Smith	Smithtown bay	Granted January 4, 1888.
34	Alanson E. Hallock	Smithtown bay	Granted January 4, 1888.
35	Coe D. Smith	Smithtown bay	Granted January 4, 1888.
36	George W. Hallock	Smithtown bay	Granted January 4, 1888.
37	Stephen L. Halsey	Smithtown bay	Granted January 4, 1888.
38	James Church Smith	Smithtown bay	Granted January 4, 1888.
46	David Joline	Raritan bay	Partially granted January 4, 1888.
47	David Joline	Raritan bay	Granted November 7, 1888.
49	Alfred Sprague	Raritan bay	Granted January 4, 1888.
50	Elmer Price	Raritan bay	Partially granted January 4, 1888.
57	Alfred Du Bois	Raritan bay	Partially granted January 4, 1888.
58	Estate of Aaron Van Name	Raritan bay	Granted April 2, 1888.
61	Henry Van Name	Raritan bay	Partially granted January 4, 1888.
70	George E. Forrester	Raritan bay	Partially granted November 7, 1888.
73	Lewis S. Davis	Smithtown bay	Granted January 4, 1888.
74	Jeremiah Darling	Smithtown bay	Granted April 2, 1888.
75	Edward N. Smith	Smithtown bay	Granted April 2, 1888.
77	D. W. Van Name	Raritan bay	Partially granted November 7, 1888.
78	Nils Pederson	Raritan bay	Partially granted January 4, 1888.
79	William Bush	Raritan bay	Granted April 2, 1888.
85	John Brinley	Raritan bay	Granted November 7, 1888.
89	Israel P. Mersereau	Raritan bay	Granted November 7, 1888.
92	Andrew Ackerly	Smithtown bay	Granted August 6, 1888.
92	Sarah M. Thompson	Smithtown bay	Granted November 7, 1888.
98	Garrett Post	Smithtown bay	Partially granted November 7, 1888.
99	William Joline	Raritan bay	Granted January 4, 1888.
100	Edward Thompson	Smithtown bay	Granted January 4, 1888.
101	James Cockraft	Smithtown bay	Granted July 6, 1888.
102	Edwin A. Rowlig & Scudder Smith	Smithtown bay	Granted July 6, 1888.
103	N. S. Ackerly	Smithtown bay	Granted July 6, 1888.
104	Joseph S. Lewis	Smithtown bay	Granted August 6, 1888.
105	Edward Pidgeon	Smithtown bay	Granted July 6, 1888.
106	Obadiah and Matthew G. Barton	Long Island sound.	Granted August 6, 1888.
107	Clarence S. Green	Smithtown bay	Granted August 6, 1888.
108	Henry Skidmore	Smithtown bay	Granted August 6, 1888.
109	Peter Miller	Raritan bay	Granted.
110	William N. Manee	Raritan bay	Granted Jan. 4 and April 2, 1888.
111	Heirs of Jacob Manee	Raritan bay	Granted April 2, 1888.
113	Edward Kane	Smithtown bay	Granted April 2, 1888.
214	C. S. Sofield	Raritan bay	Granted January 4, 1888.
115	D. and R. Price	Raritan bay	Partially granted January 4, 1888.
118	Heirs of C. C. Jones	Raritan bay	Partially granted January 4, 1888.
120	Abram Martineau	Raritan bay	Partially granted November 7, 1888.
122	Albert M. Darling	Smithtown bay	Granted April 2, 1888.
123	Benjamin Taylor	Smithtown bay	Granted July 6, 1888.
124	Benjamin Taylor	Smithtown bay	Granted April 2, 1888.
125	Charles Tyler	Smithtown bay	Granted July 6, 1888.
126	George E. Call	Smithtown bay	Granted August 6, 1888.
127	William H. Furman	Smithtown bay	Granted April 2, 1888.
128	Joseph J. Tyler	Smithtown bay	Granted April 2, 1888.
129	John M. and Jos. J. Tyler	Smithtown bay	Granted July 6, 1888.
130	John M. Tyler	Smithtown bay	Granted April 2, 1888.
131	Elias S. Pratt	Smithtown bay	Granted April 2, 1888.
132	Albert M. Darling	Smithtown bay	Granted April 2, 1888.
133	Emma J. Tyler	Smithtown bay	Granted April 2, 1888.
135	Joseph Price	Raritan bay	Granted January 4, 1888.
138	Ebenezer Bryant	Smithtown bay	Granted July 6, 1888.
139	Andrew M. Cannon	Raritan bay	Partially granted January 4, 1888.

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CLERK'S REPORT — (*Continued*).

Number.	NAME.	Location.	Action of commissioners.
141	David G. Bryant	Smithtown bay	Granted November 7, 1888.
145	Franklin Van Pelt	Raritan bay	Partially granted November 7, 1888.
146	C. W. Call	Smithtown bay	Granted November 7, 1888.
149	Jonah J. Manee	Raritan bay	Granted Jan. 4 and Nov. 7, 1888.
151	Butler & Drake	Raritan bay	Partially granted January 4, 1888.
153	Croel Depuy	Raritan bay	Granted November 7, 1888.
156	J. and B. K. Simonson	Raritan bay	Granted January 4, 1888.
157	B. K. Simonson	Raritan bay	Partially granted January 4, 1888.
158	Roscoe Bishop	Long Island sound.	Granted August 6, 1888.
160	John Sleight	Raritan bay	Granted January 4, 1888.
161	Jacob Edwards	Raritan bay	Partially granted November 7, 1888.
164	Sarah E. Christopher	Raritan bay	Granted January 4, 1888.
185	R. C. Du Bois	Raritan bay	Granted January 4, 1888.
186	Cornelius Simonson	Raritan bay	Partially granted January 4, 1888.
188	Elnathan Hall	Long Island sound.	Granted November 7, 1888.
193	John B. Wood	Raritan bay	Granted November 7, 1888.
204	Kirk Underhill	Long Island sound.	Granted June 27, 1888.
206	Oscar L. Decker	Raritan bay	Granted April 2, 1888.
212	Alfred Du Bois	Raritan bay	Granted November 7, 1888.
219	W. H. Felch	Raritan bay	Partially granted May 7, 1888.
222	David D. Decker	Raritan bay	Partially granted April 2, 1888.
224	Sherman Decker	Raritan bay	Granted April 2, 1888.
226	Wesley Kingsland	Raritan bay	Granted April 2, 1888.
227	Wesley Kingsland	Raritan bay	Granted April 2, 1888.
228	Wesley Kingsland	Raritan bay	Granted April 2, 1888.
234	Dorea J. Johnson	Raritan bay	Partially granted May 7, 1888.
241	T. F. and S. De Hart	Raritan bay	Granted April 2, 1888.
243	W. W. W. La Forge	Raritan bay	Granted November 7, 1888.
245	Phillip De Waters	Raritan bay	Granted June 4, 1888.
247	J. B. C. Winant	Raritan bay	Granted November 7, 1888.
248	C. M. Drake	Raritan bay	Granted April 2, 1888.
249	David Price	Raritan bay	Granted August 6, 1888.
250	David Price	Raritan bay	Granted April 2 and Nov. 7, 1888.
257	John E. La Forge	Raritan bay	Granted November 7, 1888.
265	Almer Decker	Raritan bay	Granted April 2, 1888.
267	Alfred Stover	Raritan bay	Granted April 2, 1888.
272	Mrs. Eliza A. Miller	Raritan bay	Partially granted November 7, 1888.
274	Arthur C. Sofield	Raritan bay	Granted May 7, 1888.
278	John F. A. Wagner	Raritan bay	Partially granted November 7, 1888.
280	John E. Merritt	Long Island sound.	Granted June 4, 1888.
289	Nicholas La Forge	Raritan bay	Granted November 7, 1888.
291	James L. La Forge	Raritan bay	Granted April 2, 1888.
292	James L. La Forge	Raritan bay	Granted April 2, 1888.
294	Nathan L. Butler	Raritan bay	Granted April 2, 1888.
299	Cornelius and Alf. Palmer	Raritan bay	Granted November 7, 1888.
305	Henry DeHart	Raritan bay	Granted June 4, 1888.
306	Matthias DeHart	Raritan bay	Granted November 7, 1888.
314	C. H. Brown	Raritan bay	Granted November 7, 1888.
315	Annie I. Fisher	Raritan bay	Granted November 7, 1888.
318	Henry H. Adams	Long Island sound.	Granted June 4, 1888.
319	Benjamin Rausch	Long Island sound.	Granted June 4, 1888.
320	John Vreeland	Long Island sound.	Granted June 4, 1888.
321	John K. Poweel	Long Island sound.	Granted June 4, 1888.
323	Wm. J. Barnett	Long Island sound.	Granted June 4, 1888.
324	D. L. Van Horn	Long Island sound.	Granted June 4, 1888.
326	C. P. Vreeland	Long Island sound.	Granted June 4, 1888.
344	Abil Martin	Raritan bay	Granted November 7, 1888.
346	Wm. Post	Long Island sound.	Granted June 4, 1878.
349	George E. Merrill	Raritan bay	Granted November 7, 1888.
352	Charles Moss	Raritan bay	Granted August 6, 1888.
358	Alfred V. R. Palmer	Raritan bay	Granted November 7, 1888.
362	Albert Verity and Brother	Long Island sound.	Granted November 7, 1888.
364	Daniel Velson	Long Island sound.	Granted September 4, 1888.
367	Abraham Latourette	Raritan bay	Granted November 7, 1888.
373	James La Page	Raritan bay	Granted November 7, 1888.
375	R. F. and H. De Hart	Raritan bay	Partially granted August 6, 1888.
380	F. W. Brown	Raritan bay	Granted September 4, 1888.
385	Amanda Tufts	Raritan bay	Granted November 7, 1888.
389	Wm. N. Manee	Raritan bay	Granted November 7, 1888.
391	Nathaniel D. Butler	Raritan bay	Granted November 7, 1888.
398	E. P. Manee	Raritan bay	Granted November 7, 1888.
404	Henry Davis	Long Island sound.	Granted November 7, 1888.
405	Stephen Valentine	Long Island sound.	Granted November 7, 1888.

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CLERK'S REPORT — (*Concluded*).

Number.	NAME.	Location.	Action of commissioners.
406	James Southard.....	Long Island sound.	Granted November 7, 1888.
407	Fred Davis.....	Long Island sound.	Granted November 7, 1888.
408	Wm. Southard	Long Island sound.	Granted November 7, 1888.
409	John A. Southard.....	Long Island sound.	Granted November 7, 1888.
411	Charles Valentine	Raritan bay	Granted November 7, 1888.
414	Frank Joline.....	Raritan bay	Granted November 7, 1888.
425	David Wood & Co.....	Raritan bay	Granted November 7, 1888.
438	R. C. Meserole	Long Island sound.	Granted November 7, 1888.
444	John W. Journeay.....	Raritan bay	Granted November 7, 1888.
450	Samuel Frost	Long Island sound.	Granted November 7, 1888.

REPORT OF STATE OYSTER PROTECTOR.

No. 80 FULTON MARKET,
NEW YORK CITY, *November* 30, 1888.

EUGENE G. BLACKFORD, Esq.,

Commissioner of Fisheries and Shell Fish Commissioner State of New York:

DEAR SIR.—I have the honor to transmit herewith my report for the year ending November 30, 1888.

Very respectfully.

JOSEPH W. MERSEREAU,
State Oyster Protector.

No. 80 FULTON MARKET,
NEW YORK CITY, *November* 30, 1888.

EUGENE G. BLACKFORD, Esq.,

Commissioner of Fisheries and Shell Fish Commissioner, New York State:

DEAR SIR.—I respectfully submit the following report of my operations as State Oyster Protector for the year ending November 30, 1888.

Since my last annual report, in accordance with your directions, I have reported daily at this office, except on the dates hereinafter mentioned; viz.: December 25, 1887; January 2, 1888; January 10, 1888; February 14, 1888; March 12, 1888; July 4, 1888; November 6, 1888; November 27, 1888, and November 29, 1888.

I have been on duty only part of a day on the dates hereinafter mentioned, viz.: February 22, 1888; March 13, 1888; June 14, 1888;

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June 19, 1888; June 20, 1888; September 3, 1888, October 27, 1888, and November 13, 1888.

On all other days from November 30, 1887 to November 30, 1888, inclusive (except Sundays), I have been on duty all day subject to your instructions.

I have acted in accordance with your directions in respect to the execution of the various duties appertaining to this office.

The same method of inspection of manufacturing localities, fully set forth in my last annual report, has been pursued during the past year.

Frequent inspection of manufacturing localities, and the knowledge upon the part of manufacturers that samples of effluents from their respective establishments were being collected and preserved as evidence of their infraction of the law, has operated to induce manufacturers to exercise greater care in respect to the pollution of the streams.

In some instances parties have pleasantly and heartily coöperated with me to improve the character of the effluents from their establishments.

The oil refiners exercise much greater care in respect to effluents, and the deposit of waste matter than heretofore, thus the outflow of prohibited substances has been perceptibly restricted, and the result is very gratifying.

It is very seldom that any considerable quantity of sludge-acid or other, heavy, oily refuse of any character is observed upon the main stream, and in such instances it is mainly due to sepiage, leakage of pipes, or tanks, or the result of the washing of the foul accumulation about the oil plants into the slips by heavy drenching rains.

Almost all of the foul matter which reaches the slips in the manner above indicated, is collected and prevented as far as possible from reaching the main stream, which is done by operating blanketing scows in the slips.

A blanketing scow is about fifteen feet in length, five feet in width and two feet in depth and is usually operated by two men. Some are without decks, others have decks.

A wringing machine is placed in the middle of the scow, the (best) woolen blankets are thrown from the scow by the operatives with much skill, so as to spread over the substance to be collected. The woolen blankets absorb oil or oily refuse very readily. When the blanket has taken up the material intended to be collected, it is drawn to the scow and passed through the wringer, the oil and such water as may have been taken up is then wrung out by the machine into the scow, the material thus collected is subsequently pumped out to be subjected to treatment.

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The discharge of a certain proportion of oil with the water ballast from oil-tank ships has also been attended to with marked success, thus another source of evil has been almost entirely abrogated. Many oil-pipes hitherto underground, about the oil plants, have been placed above ground; this has necessarily operated to lessen the amount of sepiage arising from frequent leakage of underground pipes.

I must therefore commend the earnest efforts of oil refiners to improve the heretofore repulsive condition of the waters in the vicinity of oil plants, and am pleased to report that the universal testimony of users of the waters of this section is to the effect that the condition of the streams of the oyster region is much better than heretofore.

Anglers have been more numerous in this section this year than formerly, the unusually large catches of fish secured by sportsmen attracted public attention, and elicited much praise as to the improved condition of the waters of this vicinity.

Gas works, during the past year, emitted the most offensive matter.

I have endeavored to correct this evil; in some instances additional safeguards have been constructed at my suggestion, in other instances but little heed has been paid by certain corporations to the infraction of the law.

I have caused two (gas) corporations to be indicted since my last report, and have lodged complaints against others. I have also collected additional evidence against other offenders, which evidence is held and will be presented to the grand juries of the respective counties in which the offenses occurred, when I am afforded an opportunity to obtain conviction, as owing to an omission in the present Code of Criminal Procedure, it has been decided that a corporation can not be compelled to appear in court and answer to an indictment.

This matter came up on December 20, 1888 (since my last annual report), in the matter of the indictment in New York county, found on November 30, 1887, against the Equitable Gas-light Company, Thirty-ninth street, East river, and the Consolidated Gas Company (two plants), Twenty-second street, East river, and Ninety-ninth street, East river.

The aforesaid cases being called before Recorder Smyth, New York county, a motion was made to quash the indictments — the party making the motion disclaimed being there as a representative of the indicted corporations. The recorder denied the motion to set aside the indictments * * * and held that the indictments were valid, and subsequently on January 30, 1888, delivered a written opinion at

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length to the effect that indicted corporations could not be compelled to appear and make answer as follows:

There is, the recorder finds, no law providing for notice after indictment, or for compelling the attendance of a corporation, if it fails to appear by counsel. The recorder adds: "I have deemed it proper to place my views in writing as to the apparent omission to provide a remedy to compel a corporation indicted for a criminal offense to appear and submit to the jurisdiction of the court in which the indictment may be filed, so that a remedy may be provided by legislation to cure the omission."

Thus the prosecution of the aforesaid offenders failed through no fault of mine, but was entirely owing to the faulty legislation aforesaid.

At the ensuing session of the Legislature an amendment known as Assembly bill (printed) No. 928 to amend section No. 681 of Code of Criminal Procedure was introduced, the amendment sought to remedy the omission in the aforesaid code. Although the bill passed both houses of Legislature it failed to become law. Thus I was rendered powerless to prosecute the indicted corporations during the past year.

The indictments obtained by this office in other counties were also held in abeyance owing to the judicial opinion hereinbefore quoted. I have eight indictments awaiting trial and a (second) sworn complaint entered against one of the indicted corporations.

I have many samples of prohibited effluents, since collected, to be presented when the aforesaid code is remedied so that conviction is made possible.

It is to be hoped that the Legislature soon to convene will appreciate the necessity for an amendment of the code as hereinbefore indicated, and that such bill will be approved by the Governor.

The matter of complaint upon the part of oystermen of City Island in July last as to the depositing of the dredgings from Pelham creek has been settled without injury to the oyster industry.

After conferring with you as to the grievances of complainants I visited City Island and arranged for the apprehension of the first and all parties thereafter found dumping dredgings as alleged by complainants.

The work at Pelham creek was immediately suspended and the dredging machine and mud scows were towed away the next day.

The subsequent application to this office upon the part of the contractors and others interested in the dredging of Pelham creek

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to dump dredgings in Long Island sound at a point to be located within the limits prescribed by chapter 300, Laws of 1886, was denied. Lieutenant J. J. Hunker, U. S. N., Supervisor, port of New York, also conferred with this office as to a suitable location at which dredgings, &c., could be dumped in Long Island sound without injury to the oyster industry.

It was held by this office, that it had no authority to issue permits, or to locate a point at which dumping might take place; that this office was only authorized to prevent dumping of prohibited matter within certain limits prescribed by chapter 300, Laws of 1886.

Lieutenant Hunker subsequently selected such a location for dumping in Long Island sound as was satisfactory to this office.

It was also arranged that such material as should be in the near future dredged at Pelham creek to complete the present contract should be dumped behind bulk-heads at City Island, to which none of the aforesaid complaints have objected.

In respect to the subject of dumping dredgings, cellar dirt, ballast, etc., in the harbor, I take the liberty to again respectfully ask attention to the following matter from my last annual report, and earnestly suggest that legislative action be taken in respect to the same.

"Oystermen complain that under the cover of night, dredgings from slips and other refuse is deposited near and upon oyster grounds to their injury.

"Steam dredges are continually operating in and about the slips and waterways of this section. The vast accumulation of material from this source, together with sand, mud, earth, cellar dirt, stone, ashes, cinders, ballast, or other heavy substances of various descriptions obtained from and about the large cities of this section, aggregates into an enormous volume. The numerous scows laden with the above-named materials are towed from their base of operation at day or night, as the tide may suit.

"It is not an uncommon sight to observe scows laden with dredgings being towed during the day to some convenient point and made up in tows, the cargoes to be dumped at night. The indiscriminate dumping of mud dredgings from slips materially injures the harbor. I have not personally observed such illegal dumping. Boatmen have informed me that while navigating New York bay and Raritan bay at night, they have been sufficiently near tows of aforesaid character to hear the operation of dumping. In no instance did they obtain such evidence as would specifically fix the offense upon any particular party.

"In some instances the tug towing the scows at night violated the law by not having lights set. This, of course, was to prevent detec-

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tion. In some instances it is believed that the offenders proceeded from the slips at Perth or South Amboy, or other points in New Jersey.

"The reprehensible practice of dumping in the harbor in disregard of certain bounds and limits could be stopped as effectively as in the matter of dumping at Execution light, Long Island sound, last year, if the proper action be taken."

I would respectfully renew and amend my suggestion in my last report, "That to abolish the nefarious practice aforesaid, the present success of which is mainly due to its being done under the cover of night, would be to enact a law forbidding the dumping of garbage, dredgings and other refuse matter into the waters of this section, except in the daytime, at certain points to be designated. This would have a signal effect in correcting the evil complained of, and also to impose upon the offender a heavy fine; and allow any citizen to become an informer; and entitle such citizen acting as an informer to an equitable proportion of the fine, after the cost of prosecution be first deducted from the fine imposed. Upon the New Jersey shores of the Hudson river, New York bay, Kill von Kull, Staten Island sound and Raritan bay are located many oil refineries and kindred establishments emitting refuse into the said waters; dredging from slips, and other refuse from the State of New Jersey, is deposited into the waters of the State of New York to the injury of the oyster industry and other important interests."

I would, therefore, suggest that a conference be had between the law-making powers of both States aforesaid, to the end that each State enact a law of like tenor and purport to remedy the aforesaid evil.

A bill was introduced in the last Legislature to legalize the dumping of dredgings, etc., in Long Island sound at a point to be designated, not nearer than twenty (20) miles from New York city.

This office directed public attention to the outrage and aroused opposition thereto by sending circular letters to members of both Houses of the Legislature, and also to prominent citizens of the four counties to be most injuriously affected by the scheme.

This office also strenuously opposed the bill before the House committee, Commissioner Blackford being one of the most active, earnest and influential opponents of the iniquitous measure.

Many of of the most influential citizens and officials of the counties of New York, Westchester, Queens and Suffolk also opposed the bill before the committee.

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The press of New York city also exposed and denounced the scheme in strong language, a few extracts only being here submitted, viz.:

[New York Sun, March 6, 1888.]

DUMP THE GARBAGE IN THE SEA.

A bill lately introduced in the Assembly * * * and reported favorably from committee, if enacted, would be an intolerable outrage.

It proposes to allow dumping of New York city garbage in Long Island sound at a point not nearer than twenty miles from city hall. The stuff, therefore, that the law now says shall be taken out to sea, and committed to the ocean, would be dropped along the banks of narrow waters which are hemmed in by the dwelling places of a very large population. The probability is, judging from the experience of dumping by the way of Sandy Hook, that the garbage would be deposited within the twenty-mile line, and thus the whole East river, from Hell Gate to Throgg's Neck, and the sound beyond to Sand's point, a narrow passage, would be strewn with city refuse, and the effect would be seen and smelt all along the shores on both sides.

But even if the prescribed limit should be rigidly observed, the effect would still be disastrous and intolerable.

Twenty miles from city hall, on the sound, carries one to Prospect Point, or about half a mile beyond Execution Light. This is at the mouth of Hempstead harbor, and on the edge of the sound's first broad expanse and one of its greatest oyster fields.

Barring a sandy stretch at the eastern end of Long Island, the shores of the sound on either side are thickly populated clear up to Plum Gut and Fishers island. By this bill these shores, which are now clean, sweet and beautiful would be deluged by filth and perhaps impregnated with disease.

There is no excuse for it. In front of New York harbor is a vast expanse where street sweepings, until disposed of by some chemical process, should be deposited; and so long as the ocean lies before us, the broad and "exonerating" sea, as Oscar Wilde's poetic fancy saw it, it is there where the city's garbage should be dumped.

[New York Sun, March 7, 1888.]

AN EARLY START.

We learn that the * * * bill for dumping garbage in Long Island sound will be brought up in the Assembly to-morrow morning at half-past nine. Nine thirty A. M. is an early hour for an individual business man to begin work, but the Assembly seems to think that a very early vigil is the price of this bill. Yet it is about the nastiest idea ever introduced into the Legislature.

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To think of dumping all the refuse of this great city in the narrow waters of the East river and Long Island sound! when the great ocean is at our doors, too!

The promoters of this bill should be ashamed to show it outside of the committee, but if they are not it should be emphatically rejected, even if it should be brought to a vote at sunrise.

[Evening Post, March 7, 1888.]

We trust the gentlemen who have gone up to Albany to oppose * * * bill providing for dumping in Long Island sound will pay no money to * * * for letting it drop. To do so would be to encourage similar attempts at public injury and annoyance. He must be allowed to stew in his own grease.

[New York Times, March 7, 1888.]

The exposure of the outrageous scheme to turn this end of Long Island sound into a dumping ground did not come too soon.

It seems that * * * has procured the reference of the bill away from the appropriate committee, that on commerce, to the Committee on Trade and Manufactures, to the duties of which its subject-matter is perfectly irrelevant.

This committee does not contain a single member from New York, Westchester or Queens * * * the hearing for it to-morrow is at the outrageous hour of half-past nine o'clock in the morning; so that it will be necessary for representatives of its opponents to go to Albany to-night in order to obtain a hearing.

Impudent and disgraceful as this attempt is to evade opposition to this job, there is yet time enough to beat it. The exposure will doubtless be complete.

To guard efficiently the vast territory comprising a part of Long Island sound, East river, Hudson river, New York bay, Kill von Kull, channel between Staten Island and New Jersey, Staten Island sound and Raritan bay, is a work of no small character. The small appropriation allowed for this purpose precludes the possibility of such supervision as the importance of the great oyster industry demands.

SUMMARY FOR THE YEAR ENDING NOVEMBER 30, 1888.

Days on which I reported for duty	306
Days on which I remained on duty all day	298
Days on which I remained on duty only part of a day	8
Days on which I did not report for duty (not including Sundays)	9

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Suits pending in Richmond county	3
Suits pending in New York county	3
Suits pending in Westchester county	2

SALARY.

Balance available on November 30, 1887	$500 02
Amount appropriated in May, 1888	1,000 00
	$1,500 02
Amount received for year ending November 30, 1888	1,000 00
Balance available for ensuing year	$500 02

FOR TRAVELING AND INCIDENTAL EXPENSES, ASSISTANT, RENT, TUG HIRE, ETC.

Balance available on November 30, 1887	$1,314 98
Amount appropriated in May, 1888	750 00
	$2,064 98
Amount disbursed for year ending November 30, 1888	850 43
Balance available for ensuing year	$1,214 55

The balance above shown does not by any means indicate that the appropriations heretofore made are adequate for the work of guarding the vast oyster territory of the State.

To provide for any emergency that might arise during the year demanding special work with its corresponding increase of expenditures, together with the fact of the uncertainty of obtaining convictions during the past year, owing to the aforesaid omission in the code, has justified the least possible expenditure compatible with the exigences of the service.

To properly and expeditiously meet the demands of the service a sufficient appropriation should be made to provide for the maintenance or frequent hire of a steam patrol vessel.

An effort will be made to remedy the omission in the code by legislation during the next session of the Legislature.

Very respectfully.

JOSEPH W. MERSEREAU,
State Oyster Protector.

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GAME AND FISH PROTECTORS.

ALBANY, *December* 1, 1888.

To the honorable the Commissioners of Fisheries:

GENTLEMEN.— In compliance with the resolution adopted at the last meeting of your board, and pursuant to the requirements of section 7, chapter 577, Laws of 1888, I herewith submit a summary of the proceedings of the department under my immediate supervision.

A little more than two months have passed since I assumed the duties of the office, and I trust a brief recapitulation of the situation at that time will not be considered out of place in this connection.

The efficiency of the force at my command was somewhat impaired, unavoidably, perhaps, by reason that for more than a year the tenure of office of each protector has been uncertain, as the time for which they were appointed had long since passed in every instance, and as all received the same compensation there seemed less incentive to a faithful discharge of duty. This condition lasted until last June, when, about the twelfth, they were informed that by legislative enactment, which had become a law on the ninth, they could not legally act as protectors. From this time for several weeks no restrictions existed throughout the State. Indeed, some of the vacancies were not filled until September. Then, too, every fisherman in the State was fully informed that one distinguished judge considered nets, however illegally used, property, and, like trusts, "they must not be interfered with."

The result of all this was very apparent. We were losing ground, and it was of the utmost importance that the tide should be turned at once. Nearly one-half of the protectors were new and required some instruction and assistance, which encroached upon my time to a considerable extent, while the adjustment of an elaborate system for obtaining and preserving for instant reference a complete statement of every transaction in any way connected with the enforcement of the law could not be deferred, and only permitted a temporary arrangement of the districts and assignments thereto.

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Under these circumstances the results placed before you on this occasion are more gratifying, because they indicate that under more favorable conditions very satisfactory results will be obtained.

Some of the most important sections of the Adirondacks and of our inland waters have received careful attention. Important movements have been executed by special orders to several members of the force, supplemented by personally assisting in every way in my power, and I can safely assure you that the result of movements now being carried out in several localities can not fail to bring to punishment a large number of violaters in the past, some of whom have thus far considered themselves unsuspected, and will, beyond a doubt, do much to enforce a better observance of the law in the future.

From my own observation, supported by the statements of protectors, sportmen and guides, I am positive that the number of deer in the Adirondacks the past season was in excess of former years and that fishing in many important localities has greatly improved notwithstanding the drawbacks before alluded to.

A friendly interest is manifested in the maintenance of the game laws by every department of the State, particularly by the Attorney-General and his assistants, from whom I have at all times received the most cordial support.

The present location of this office is very inconvenient indeed. It will be impossible to properly transact here the constantly increasing business of the office, and we should be assigned a room of our own, as much of the business of this department is of a nature frequently requiring a conference conducted with the utmost privacy which cannot be expected while occupying an office with others.

The recommendations presented to the Legislature in your last report respecting a commission to codify and "make clear, compact and consistent all sections of the game laws which are now vague, contradictory or impracticable," is of the utmost importance, and I trust the commissioners will press the matter as soon as our law-makers convene.

In this connection I would respectfully suggest that a conference between your commission and the ministers of fisheries of the Dominion of Canada, would result in securing much needed coöperation in the work of protecting the St. Lawrence river. A united effort on the part of both governments will attain what neither can alone accomplish.

Fully appreciating the great responsibilities you have been pleased to honor me with and relying upon your wisdom and experience for

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guidance in the future, I pledge you my best efforts in the discharge of every duty assigned me.

The statement following will show the detail work done in the department as far as the public interest will be served by present publication.

FREDERICK P. DREW,
Chief Game and Fish Protector.

STATE OF NEW YORK:

CHIEF GAME AND FISH PROTECTOR'S OFFICE,
ALBANY, *December* 6, 1888.

To the Commissioners of Fisheries:

GENTLEMEN.—I am directed by Chief Game and Fish Protector Drew to furnish to your honorable board a statement, so far as I am able, of the operations of his department since his appointment, September 4, 1888, and which is hereto annexed.

The demand upon Mr. Drew's time has been continual, and it is with difficulty he is enabled to spend a day at headquarters. He came to Albany last evening intending to remain until he had prepared a full report, but on arrival here he found a communication from Commissioner Blackford requiring him to visit the Thousand Islands, St. Lawrence river, and, if possible, report the result of the investigation to the next meeting of your commission. He accordingly left for that place by first train this morning.

On his return he will, as soon as possible, prepare a report, etc., of his work and supply the deficiencies that necessarily occur in this statement.

Very respectfully.

JOHN LIBERTY,
Clerk.

A general order was issued on the sixteenth of September, a copy of which is hereto annexed, as follows:

GENERAL ORDER No. 1.

OFFICE OF CHIEF GAME AND FISH PROTECTOR.
ALBANY, N. Y.....1888.

Mr.....

SIR.—By the statute, chap. 577, Laws of the State of New York for 1888, you are placed under the "direction and supervision" of the Chief Game and Fish Protector, to whom you are required to report at the close of each calendar month instead of, as heretofore, you have done, to the Commissioners of Fisheries.

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The district to which you were then assigned when appointed by the Commissioners of Fisheries will, for the present, remain unchanged. The instructions you then received which do not conflict with the above will still govern your actions, and it only remains for me to add, that, as greater facilities have been provided for the enforcement of the Game Laws, the best efforts, to the exclusion of all other pursuits, will be required of all connected with the force. Should you require any assistance in the discharge of your official duties, or legal advise beyond that of the district attorneys of the several counties where you may be acting, you will promptly report the same to the office of chief game and fish protector to which I have been appointed by the Commissioners of Fisheries.

Copies of the Game Laws will be sent you immediately, and all the necessary blanks as soon as they are prepared.

FREDERICK P. DREW,
Chief Game and Fish Protector.

On the twenty-third of November a copy of the following letter and form of notice was mailed to each protector:

....., *Protector.*

DEAR SIR.— While the adverse decision of Judge Williams is not reversed by the higher court, a protector can not remove and destroy nets without incurring the risk of being mulcted for damages, I would advise in every instance, when the protector is positive the nets are placed in a position by which they are violating the law, that the protector should, if he remove them, carefully avoid injury to the same, and after putting them in a secure place immediately inform the owner that he has taken them to hold until claimed by an owner.

If diligent inquiry does not ascertain ownership then advertise by posting notices in public places, stating that upon proving property the owner can have the same.

The moment he claims and proves ownership, proceed against the party by civil suit for the penalty, or, if you think it more expedient, proceed against the party for a misdemeanor.

The result will be that the owner recovers his nets and the protector secures evidence sufficient to convict.

I inclose form of notice to be posted as soon as nets are secured.

Most truly yours.

FRED P. DREW,
Chief Game and Fish Protector.

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NOTICE.

Notice is hereby given that I have this day seized, pursuant to section ...., chapter 534, Laws of 1879, as amended, and removed from the waters of ....., known as ....., and now have in my possession the following devices for the taking or capturing of fish, viz.:

.....

.....

The owner can have the same by calling on the undersigned and proving property.

Dated .....

.....

Game and Fish Protector, District No....

SPECIAL ORDERS ISSUED.

September 19, 1888.

By telegraph to WILLET KIDD:

To meet Chief Game and Fish Protector at New York city on the twentieth. Did so.

28*th September*, 1888.

To GEORGE MEYER (verbal):

To accompany Chief to Camden and vicinity. Did so, and reported shipment of several snared partridges.

28*th September*, 1888.

To WILLET KIDD (verbal):

To investigate alleged violations on opposite side of river from Newburgh, in Putnam county, when the duties incident to the first special orders should be completed. Order obeyed.

September 28, 1888.

To GEORGE MEYER:

Protector Meyer will return to the vicinity of Camden and Williamstown on Monday next, October first, and continue the investigation already commenced regarding the snaring and shipment of partridges in that section. He will decide for himself what points in that section most need attention, and advise me promptly by telegraph of any shipments.

FRED. P. DREW,
Chief Game and Fish Protector.

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WILLIAMSTOWN, N. Y., *October* 4, 1888.

To FRED. P. DREW, *Chief Game and Fish Protector, Albany:*

Partridges shipped to Drohan & Powell, 214 Washington street, New York, from John Kinney, Amboy Center. Examined; found bad.

GEO. MEYER.

October 5, 1888.

To S. C. ARMSTRONG:

Violations of the Game Laws are reported to exist in the vicinity of Mechanicville, viz., spearing salmon near the dam.

On receipt of this (unless engaged on a case of more importance, in which case you will at once inform this office) carefully examine the matter in person and take prompt action to bring the offenders to punishment.

On your arrival at Mechanicville call on Mr. Wm. W. Smith, President of First National Bank, showing him this letter. I think he will give you all the assistance in his power.

Most truly yours.

FRED. P. DREW,
Chief Game and Fish Protector.

Action under order. October twenty-second. Saw Mr. Smith and also the man that takes toll at the bridge. He says there has been no spearing for the past three weeks; that the fish have gone down the river with the first flood. He thinks all the spearing was done by one party. He said he would find out all about it, and later I will go down and see if the evidence will warrant prosecution.

October 5, 1888.

To MATTHEW KENNEDY:

Commissioner Burden reports the following violations of the game laws, viz: That nets are set, contrary to law, inside the bays cut off by the Hudson River railroad, at the following places: At the city of Hudson south of depot; at Livingston station below Catskill; also in bay next south of Tivoli and the one next of Rhinebeck.

On receipt of this carefully investigate the situation, and if possible, obtain evidence sufficient to warrant an affirmative verdict in any actions you may bring against all the offenders.

FRED. P. DREW,
Chief Game and Fish Protector.

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Action under order. There are no nets set contrary to law at the places mentioned, as I understand the various sections of the fish laws. The nets referred to are fykes or hoop nets.

October 8, 1888.

The following synopsis of the reports of the several protectors for the months of September and October is hereto annexed :

ROBERT BROWN, JR — FIRST DISTRICT.

September.— Traveled 361 miles; expenses, fifteen dollars and seven cents; time, twelve days. Visited suspected places at Woodbury, Long Island City, and Valley Stream.

October.— Traveled 965 miles ; expenses, twenty-five dollars ; time, twenty-five days. The time was put in on Long Island and Staten Island. Seized a number of pound nets at Gravesend Bay on the fifth, valued at $250. Has them in his possession.

WILLETT KIDD — SECOND DISTRICT.

September.— Traveled 891 miles; expenses, twenty-nine dollars and ninty-eight cents; time eleven days. Twenty-first, twenty-second, twenty-third, twenty-seventh and twenty-eighth, at New York city looking up dealers having snared partridges in their possession, in obedience to special orders received from Chief Game and Fish Protector.

A suit brought in justice's court, in Orange county, July twenty-third, against J. H. Ferguson, was disposed of in August. Defendant fined twenty-five dollars. Moiety ($12.50) received in September.

October.— Traveled 897 miles ; expenses, thirty-eight dollars and fifty-one cents ; time, eleven days. On the fourth brought suit in justice's court at Newburgh, against W. H. Baker for having snared partridges in possession. Sixth, arrested Stephen LaForge with snared partridges in possession. Plead guilty and was fined twenty dollars.

In obedience to special order from Commissioner Blackford, on the fifteenth inspected Bronx river, and find that the dye and gas works at West Farms turn their spent dye and coal tar in said stream. The water is very foul, particularly at low tide. Seventeenth, inspected Bronx river from West Farms to East river for fykes; found none, but in East river, in Westchester county, there are fykes. Found two eel racks at Walden on the twenty-seventh; proprietors promised to take them out and keep them out.

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MATTHEW KENNEDY.—THIRD DISTRICT.

September.—Traveled 583 miles; expenses twenty-six dollars and forty-three cents; time twelve days. On the tenth, seized set line at Lake Charlotte, Columbia county, and arrested Milton Best and Peter Lasher and brought them before Justice Hollenbeck, at Greenport. Tried on the eleventh; prisoners pleaded guilty to all the charges. Best sentenced to sixty days in the county jail; Lasher, twenty-five dollars fine or three months in Albany penitentiary; no fines received. Balance of time devoted to examining markets in New York city and at Chatham, Catskill, Peekskill and Poughkeepsie.

October.—Traveled 921 miles; expenses sixty-one dollars and sixty-four cents time twelve days. Nineteenth, twenty-second, twenty-third and twenty-fourth devoted to inspecting markets at Albany and Troy, in accordance with special order received from the Chief Game and Fish Protector.

Suits brought as follows: Second, against Leroy Acker and others, justice court, Westchester county; netting in Croton river at various times in August and September. Twenty-fourth, against G. B. Smith and George A. Templeton, Rensselaer county, police court; having trapped or snared birds in possession. Suits pending.

S. C. ARMSTRONG.—FOURTH DISTRICT.

September.—Traveled 456 miles; expenses, thirty dollars; time, thirteen days. Third, fourth and fifth at court at Lake George; sixth and seventh, Johnburgh and North Creek; twelfth and thirteenth at Glens Falls to see district attorney; seventeenth, eighteenth and nineteenth, Blue Mountain lake, Racquette lake, Forked lake and Indian lake; twenty-fourth, Luzerne, in Rockwell case; twenty-seventh and twenty-eighth, Pottersville.

On the fourth, judgment was entered against Samuel Burgess for seventy-five dollars; convicted of chasing deer. (Time offense committed not given.)

October.—Traveled 696 miles; expenses, thirty-one dollars and ninety-four cents; time, eleven days. On the seventeenth twelve indictments were found by the Washington county grand jury against Aiden McIntyre, for netting and having fish in possesion at various times.

Suit was brought against the Adirondack Railroad Company, in Saratoga county Supreme Court, on twentieth, offense, transporting venison on sixteenth.

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J. W. POND — FIFTH DISTRICT.

September.— Traveled 201 miles; expenses, seventeen dollars and ıventy-five cents; time, six days. Visited Lake Titus, Long pond, eacham lake, Chateaugay lake, Chazy lake, Loon lake and Saranac ke.

October.— Traveled 371 miles; expenses, thirty-nine dollars and ıirteen cents; time, nineteen days. Visited important fishing and unting regions, including Chateaugay and Chazy lakes, St. Regis, pper Saranac and Loon lakes, State dam and Wolf pond.

PETER R. LEONARD — SIXTH DISTRICT.

September.— Traveled 325 miles; expenses, thirty dollars; time, four-ɔen days. He traveled from Clifton, on Grass river, to Bog river and ſud lake, and home via Cranberry, the Oswegatchie and Grass river. ſnder general remarks, he says: "I was very much pleased to find ıe locality in the condition I did. From where I entered the woods, hrough, until I arrived at the head of Tupper lake, going and oming, I did not see a party, nor did I see dogs nor hear them run-ing, only at Tupper lake. Parties were on transit with dogs to oints where they could legitimately run."

October.— Traveled 352 miles; expenses, twenty-seven dollars and fty cents; time, sixteen days, fourteen of which were spent in an xtended trip in the woods, mostly in St. Lawrence county. In gen-ral remarks, he says: "In my rambles I have caught on a party hat I have been after for some time. They are styled gum-pickers, nd forage summer and winter; I have four complaints. Put them ɔefore District Attorney Kellogg. He will not be able to attend to natters till after election, but as soon as can, will give them winter ıuarters."

GEORGE MOYER — SEVENTH DISTRICT.

September.— Traveled 263 miles; expenses, sixteen dollars and fifty-our cents; time twenty-four days. From fifth to twenty-first, was n the vicinity of Stillwater, Crooked lake and North ponds, in the Beaver river country. Also, visited Camden, Williamstown, Martins-burgh and Montague, in matter of snared partridges.

October.— Traveled 586 miles; expenses, fifty-two dollars and eleven cents; time, sixteen days. Suits were commenced in Lewis county Supreme Court, as follows: Third, against Roland Pebbles, snaring partridges in September; twenty-second, against M. H. Bibbins and

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Will Erving, killing and having fawn in possession, October sixteen twenty-fifth, against John D. Scrofford, transporting deer, Septemb twenty-fourth.

THOMAS BRADLEY — EIGHTH DISTRICT.

September.— Traveled 553 miles; expenses, thirty-two dollars an forty cents; time, twenty-one days. Reports violations at Ephrat and Palatine by parties from Fort Plain and Canajoharie, in Augus but was unable to get sufficient evidence to warrant commencing suit

October.— Traveled 599 miles; expenses, forty-two dollars and thirt five cents; time, twenty-five days. Nearly the whole time was devote to watching spawning beds at Jockey, Pine Bush, Good Luck, Garog and Canada lakes. He says: "With the exception of Piseco lake, th beds have not been disturbed."

FRANCISCO WOOD — NINTH DISTRICT.

September.— Traveled 190 miles; expenses, twelve dollars and forty six cents; time, four days. Fifth and sixth at Albany, Kenwood an Greenbush, to investigate complaint for illegal fishing; eighteent and nineteenth, at Troy.

October.— Traveled 360 miles; expenses, thirty-one dollars and thirty six cents; time, eight days. Was at Blenheim on the fifteenth an sixteenth; and from the twenty-second to twenty-eighth, inclusive visited Binghamton, Bainbridge, Norwich, Guilford, Sidney, Walton Delhi, Hobart, Grand Gorge, Gilboa and Middleburgh. Found n violations.

WILLIAM N. STEELE — ELEVENTH DISTRICT.

September.— Can not give number of miles traveled; expenses, thirty-one dollars and seventy-nine cents; time, sixteen days. All but three days were spent at Chippewa bay, Eel bay, Flynn's bay and Alexandria bay.

October.— Traveled 170 miles; expenses, fifteen dollars and forty-two cents; time, nineteen days, as follows: Seven days at Eel bay, three at Watertown, five at Chippewa bay, three at Salmon river and one at Flynn's bay.

HENRY C. CARR — TWELFTH DISTRICT.

September.— Can not give number of miles traveled; expenses, twenty-five dollars; time, twenty-one days. Seized and destroyed two

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-racks on the Susquehanna on the twenty-seventh; the balance of
e at Skaneateles lake, Owasco lake, Senaca river, and at Lock pond.
October.—Can not tell number of miles traveled; expenses, twenty-
dollars; time, twenty-six days. Most of the time was spent on
yuga, Onondaga and Oneida lakes. On the tenth, seized six trap
s at Oneida lake, valued at $300, and on the eighteenth, five gill
l one trap nets at Onondaga lake, valued at $125. All left in the
nds of the sheriff of Onondaga county.

JOHN SHERIDAN — THIRTEENTH DISTRICT.

September.—Traveled 805 miles; expenses, twenty-five dollars and
renty-five cents; time, thirteen days. The time was put in at Cayuga
ke, Lake Keuka, Seneca lake, Cohocton river and Lake Salubria.
e seized and destroyed at the above places ten gill nets, of the
gregate value of $150.

October.—Traveled 982 miles; expenses, twenty-six dollars; time,
renty-three days. Most of time spent at Keuka lake and Seneca lake.
he following nets were seized and destroyed: first, one gill net,
ranchport, Keuka lake; third, two gill nets, Bluff Point, Keuka lake;
th, one gill net, Hammondsport, Keuka lake; ninth, one gill net,
resden, Seneca lake; eighteenth, one gill net, Watkins, Seneca lake;
renty-second, one gill net, Long Point, Seneca lake; twenty-sixth,
ne gill net, Loomis Point, Keuka lake; thirty-first, two gill nets,
ladden's Point, Keuka lake. The aggregate value of the nets
estroyed was $175.

GEORGE M. SCHWARTZ — FOURTEENTH DISTRICT.

October.—Traveled 691 miles; expenses, $104,60; time, twenty-one
lays. On the eighth, seized and destroyed four fyke nets at Long
nd Cranberry ponds; eighteenth, four fykes and leaders at Braddock's
ay and Cranberry pond. Aggregate value, ninety-five dollars. On
he third, C. B. Potter, Frank Carroll, Edward Torrey, James Turner.
John Van Amburgh, Clarence Bolton, Charles Swede, Delbert Belding,
William Thorpe and Nathan Sargent, pleaded guilty to illegal fishing,
in the court of sessions, at Lyons, and were fined ten dollars each.
The offenses were committed June third, at Sodus bay.

October.—Traveled 306 miles; expenses, eighty-eight dollars and
seventy-five cents; time, fifteen days. He seized and destroyed seven
gill nets and one fyke net at Irondequoit bay, twelve fyke nets at
Cranberry pond, six fyke nets at Long pond, two fyke nets at Genesee

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river, and five fyke nets at Braddock's bay. Agregate value $368 John Miller was fined five dollars in Monroe conuty. Moiety received two dollars and fifty cents.

CHARLES RIPSON — FIFTEENTH DISTRICT.

September.— Traveled 362 miles; expense, fourteen dollars and eighteen cents; time twenty days. Seized and destroyed one gill net on the twelfth, at mouth of Niagara river. Value about twenty-five dollars.

October.— Traveled 430 miles; expenses, nineteen dollars and sixty-eight-cents; time, twenty-one days. Visited Niagara river, above and below the falls; Lake Erie, Lake Ontario, Six Mile creek, etc.

A few of the protectors have not at this time, handed in their reports for November.

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REPORT OF COMMITTEE ON GAME LAWS.

The undersigned committee, appointed on the part of the Commissioners of Fisheries to arrange for the compilation and publication of 12,000 copies of the fish and game laws of the State and the laws for the preservation of forests, respectfully report: That they employed George Edward Kent, a lawyer in the office of General Horatio C. King, of this city, to edit and compile the laws and contracted with James B. Lyons, State printer, Albany, for their publication. The work of editing, compiling and indexing was carefully and thoroughly done, and, while the committee are not fully satisfied with the typography and binding of the book itself, they believe the edition creditable to the commission and a success. They submit herewith a statement, itemized, of the expense and the details of distribution.

A. SYLVESTER JOLINE,
EDWARD P. DOYLE,
Committee.

Expense of Edition.

George Edward Kent, services	$600 00
John L. Dailey	95 00
Adolph Reisig, typewriting	21 50
James B. Lyons, printing	1,144 79
George Edward Kent, traveling expenses	22 70
A. L. Henthorn	8 90
A. K. Sikes	13 20
Edward P. Doyle, disbursements	85 55
	$1,991 64
Appropriation	$2,000 00

Distribution.

	Copies.
Members of the Legislature	200
District attorneys and judges	500
Town clerks	1,000
Daily and weekly newspapers, New York city	42

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	Copies.
Supervisors of counties	75
Game protectors	375
Chief protector	50
Commissioners	200
Fred Mather	25
Game clubs	250
Fish commissioners of the United States and Canada	120
Miscellaneous copies	300
	3,137
On hand	900
	4,037
Forest Commission	1,500
Secretary of State	6,250
	7,750

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MINUTES.

At a regular monthly meeting of the Commissioners of Fisheries at their office in the city of New York, on Monday December 5, 1887.

All of the commissioners present.

The minutes of the last meeting were read and approved.

On motion of Commissioner Bowman, it was

Resolved, That the report of the committee appointed at the last meeting to examine as to the jurisdiction of the commission in the matter of the lands under water in Huntington bay, be postponed and no grants be issued on the debatable lands till after notice of the trustees of the town.

Shell Fish Commissioner Blackford reported, as to Little Neck bay, that the outer or northern boundary of said bay, as determined by him on December 3, 1887, is a line connecting the outer end of the government wharf at Willet's Point and the outer end of the "Clay Dock" on Great Neck; that the lands available for oyster cultivation are included in a square of 750 meters, sides bounded on the north by parallel 40° 47′ and west by meridian west 73° 46′, except the portion at the southwest corner which falls within the 500 foot curve from low-water mark; that there are approximately 133 acres of available land in said bay and that there are twenty-six applications for lands there, aggregating 700 acres. viz.: Eighteen applications for five acres, one application for ten acres, two applications for twenty-five acres, one application for thirty acres, two applications for 250 acres.

The commissioner also reported that in the matter of Smithson bay two hearings had been held at which a large number of people living in the vicinity of Smithtown attended, and all parties agreed that Smithtown bay was not natural growth oyster territory, all oysters found there being the result of cultivation.

On motion of Commissioner Bowman, the president of the board was authorized to receive and examine all applications for oyster land franchises before presentation to the commission.

The president presented a communication to the commission from the State Civil Service Commission, calling for a roster of all persons employed by the Commissioners of Fisheries, which the secretary, on motion of Commissioner Sherman, was instructed to furnish.

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On motion of Commissioner Bowman, the execution of the grants in applications numbered three and four, approved at the last meeting, was postponed until further order of the board.

On motion of Commissioner Blackford, the price per acre for lands under water of Smithtown bay was fixed at fifty cents.

The November report of the protectors were submitted to the board, examined, passed, and the usual certificates ordered to be issued by the secretary.

The secretary submitted a communication from William H. Burnett, late of G. Warner Company, touching an alleged violation at Albany, in August and September last, of section 3, chapter 567, Laws of 1870.

Commissioner Sherman offered the following resolution, which was laid upon the table till the next meeting:

Resolved, That the district-attorney of Albany county be authorized to bring suits in the name of this commission against such persons as he shall be satisfied from trustworthy information given him have violated the provisions of chapter 567, Laws of 1870, in taking shad unlawfully from the Hudson river in August and September, 1887.

A communication from the protector of the fourth district, with the letter addressed to him by F. J. Fitch and others, touching a suit instituted by him, was read, and, on motion of Commissioner Sherman, a resolution was agreed to recommending the withdrawal of the suit.

On motion of Commissioner Sherman, it was

Resolved, That Protector Thomas Bradley, of the eighth protection district, be authorized to employ O. M. Parke, late district attorney of that county, to assist the present district attorney of Fulton county in the case of the People *v.* Patrick McDonald, defendant, prosecuted for violation of section 1 of chapter 124, Laws of 1886, for having in possession speckled trout in violation of the provisions of said laws, the cost of such assistance not to exceed seventy-five dollars and to be paid out of any penalties that may be recovered out of the moneys appropriated for the necessary contingent expenses of the Commissioners of Fisheries in the discharge of their duties, under chapter 317, Laws of 1883.

On motion of Commissioner Blackford, the price for occupied lands in Little Neck bay was fixed at fifty cents per acre.

On motion of Commissioner Bowman, the following preamble and resolution was adopted:

WHEREAS, The time for the next meeting of the board occurs on Monday, January 1, 1888, which is a legal holiday, therefore,

Resolved, That when the board adjourns to-day it adjourns to Wednesday, January 4, 1888.

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On motion of Commissioner Blackford the clerk of the commission was authorized to have printed 1,000 copies of the blank for enrollment of applications, to visit the various town clerks and obtain affidavits of posting the required notices, his expenses to be paid by the commission, and to contract for the delivery of copies of all laws affecting the Commissioners of Fisheries during the coming session of the Legislature at an expense not exceeding fifty dollars.

On motion of Commissioner Bowman it was resolved that the work of building the hatcheries at Mill creek, pursuant to the act, chapter ——, Laws 1887, be committed to Commissioner Sherman, and that he be authorized to contract for the materials and work for the same with some competent person or firm for a sum in gross, or if he shall not be able to have it done satisfactorily in that manner, that he be authorized to procure the requisite materials by purchase, and to employ competent persons, mechanics and laborers to do the work, under such inspection and supervision as he shall deem necessary, the expenditure to be kept within the appropriation now remaining unexpended, and that the treasurer of this commission pay, from time to time, on the requisition of the said commissioners such sums of money as he shall need in the prosecution of his work, to be accounted for by proper vouchers, and that so much of the former resolution of this board relating to the contract of the hatchery as conflict with the resolution be and the same is hereby rescinded.

Adjourned.

H. H. THOMPSON,
Secretary.

Regular monthly meeting January 4, 1888.

Pursuant to adjournment the regular monthly meeting of the Commissioners of Fisheries was held at their office in New York on Wednesday, January 4, 1888.

Present, all the members of the board except Commissioner Sherman at the last meeting.

The minutes of the last meeting were read and approved.

On motion of Commissioner Bowman the annual report for 1887 to the Legislature, as presented to the board by Commissioner Sherman at the last meeting and subsequently amended, was adopted on the report of the commission.

On motion of Commissioner Blackford, the seal procured and presented by the clerk of the board was adopted as the seal of the commission.

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On motion of Commissioner Bowman, it was

Resolved, That the further services of the secretary to the board be dispensed with, and that he transfer his papers to Mr. Edward P. Doyle, the clerk of the commission, who will hereafter discharge the secretary's duties, to take effect at the close of the meeting.

On motion of Commissioner Joline, Mr. Blackford was authorized to purchase a safe for the use of the commission.

On motion of Commissioner Bowman, it was

Resolved, That in addition to the usual appropriation of $26,000 for the next fiscal year, and of $4,000 for the maintenance of the Lake Pleasant hatchery, as asked for in the annual report, the following additional sums be added to the estimates, viz.: For the engineers in the shell-fish department, from May 1, to October 1, 1888, $4,000; for the shell-fish department for the fiscal year ending October 1, 1889, $5,500; and for the salary of the clerk and incidental expenses, $3,500.

On motion of Commissioner Blackford, it was

Ordered, That the official hours for receiving applications for oyster land grants and for instructing concerning the same be from 10 A. M. till 2 P. M.

The commissioners proceeded to the consideration of applications presented and voted unanimously in favor of granting thirty-nine of them, the particulars in each case are on record on the book of the clerk of the commission.

Adjourned.

H. H. THOMPSON,
Secretary.

Minutes of a regular monthly meeting of the Commissioners of Fisheries, State of New York, held at their office, room 110, Potter building, Wednesday, January 4, 1888.

Present, Robert B. Roosevelt, president, and commissioners Blackford, Bowman and Joline.

Minutes of the last regular meeting read and approved.

On motion, the annual report of the commissioners was amended so as to include a recommendation that the Legislature appropriate in addition to the regular aporopriation for the commission the following sums:

To the clerk of the commission for salary	$1,500 00
For the necessary expenses of his office	2,500 00
For the engineer and the expenses of his department from May first to October first	4,000 00
From October 1, 1888, to October 1, 1889	5,500 00

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On motion, the annual report was then adopted and the secretary was directed to forward it to General Sherman to be transmitted to the Legislature.

The reports of the several game and fish protectors were then read and approved and the secretary directed to draw and forward the usual certificates.

On motion of Commissioner Bowman, Commissioners Blackford and Joline were appointed a committee to secure a larger room for the use of the commission than the one now occupied by them.

On motion of Commissioner Bowman, Commissioner Blackford was appointed a committee of one and authorized to purchase a safe for the use of the commission.

On motion of Commissioner Bowman it was resolved that the services of the secretary be dispensed with and that the duties of his office devolve upon the clerk of the commission.

The commissioners then went into the consideration of granting franchises with the following result:

Applications Nos. 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 24, 25, 26, 27, 39, 40, 41, 42, 43, 44, 45, 47, 48, 51, 52, 53, 55, 56, 58, 59, 60, 62, 63, 64, 65, 67, 68, 69, 70, 72, 76, 77, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 101, 102, 103, 104, 105, 106, 107, 108, 112, 116, 117, 119, 120, 121, 123, 125, 126, 129, 133, 134, 136, 137, 138, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 152, 153, 154, 155, 156, 158, 159, 161, 162, 163, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 505, 207, 208, being regularly before the commission were considered, but not being surveyed were laid on the table.

As to applications No. 3, E. P. Manee, and No. 4, James H. Merrill, the question of the execution of the deeds was taken up from the table and they were unanimously ordered executed.

Applications No. 21, James H. Woods; No. 22, J. P. Sprague; No. 23, Jacob I. Housman; No. 28, T. F. & S. De Hart; No. 29, Egbert Brush; No. 30, James Primrose; No. 31, William H. Furman; No. 32, George A. Smith; No. 33, William G. Smith; No. 34, Alanson W. Hallock; No. 35, Coe D. Smith; No. 36, George W. Hallock; No. 37, Stephen L. Halsey; No. 38, James Church Smith; No. 49, Alfred Sprague; No. 72, Lewis S. Davis; No. 99, William Joline; No. 100, Edward Thompson; No. 109, Peter Miller; No. 114, C. S. Safield; No. 135, Joseph Price; No. 139, Andrew N. Cannon; No. 157, B. K. Simonson; No. 160, John Sleight; No. 164, Sarah E. Christopher,

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being in proper condition and ready for the commissioners action, were granted in full.

Applications, No. 46, David Joline; No. 50, Elmer Price; No. 57, Alfred Du Bois; No. 61, Henry Van Name; No. 78, Nils Peterson; No. 110, William N. Manee; No. 115, D. & R. Price; 118, C. C. Jones' Sons; No. 149, Jonah J. Manee; No. 151, Butler & Drake; No. 185, R. C. Du Bois; No. 186, Cornelius Simonson, were granted in full.

No. 58, estate of Aaron Van Name, and No. 111, heirs of Jacob Manee, were laid on the table for informality.

On motion of Commissioner Blackford, the seal procured by the clerk was adopted as the legal seal of the commission.

On motion of Commissioner Blackford, the clerk's hours were made from 10 to 2 P. M. for official business before the commission.

The meeting adjourned.

EDWARD P. DOYLE.

Regular monthly meeting of the Commissioners of Fisheries, held February 6, 1888, at their office, room 110, Potter building.

Present, Robert B. Roosevelt and Eugene G. Blackford.

There being no quorum present, the commission adjourned.

EDWARD P. DOYLE,
Secretary.

Regular monthly meeting of the Commissioners of Fisheries, held March fifth, at their office, room 110, Potter building.

Present, Eugene G. Blackford and A. S. Joline.

There being no quorum present, meeting adjourned to Monday, March 12, 1888.

EDWARD P. DOYLE,
Secretary.

MONDAY, *March* 12, 1888.

No quorum present.

EDWARD P. DOYLE,
Secretary.

MONDAY, *April* 2, 1888.

Present, A. Sylvester Joline.

There being no quorum present, meeting adjourned to Monday, April 2, 1888, at 2 P. M.

EDWARD P. DOYLE.

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MONDAY, *April* 2, 1888, 2 P. M.

Adjourned monthly meeting of the Commissioners of Fisheries, held at the office of Eugene T. Blackford, 80 Fulton Market.

Present, Robert B. Roosevelt, president; A. Sylvester Joline, Eugene G. Blackford and General R. M. Sherman.

President Roosevelt was obliged to leave at the opening of the meeting, and on motion of Mr. Blackford, General Sherman was elected chairman *pro tem.*

On motion of Commissioner Blackford, the report of Francisco Wood was ordered to lie on the table until the next meeting.

Reports of J. L. Brinkerhoff and Peter R. Leonard were on motion approved, and the clerk directed to forward certificates.

On motion of Commissioner Joline, the clerk was directed to examine the balance of the reports of the game protectors and assign and forward certificates to those whose reports complied with the law.

On motion of Commissioner Blackford it was

Resolved, That the superintendent of the Cold Spring hatcheries be, and hereby is, authorized to insure the said hatchery against fire for the sum of $5,000.

On motion of Commissioner Blackford, it was

Resolved, That the Commissioners of Fisheries indorse Senate bill, printed No. 248, introduced by Mr. Deane, prohibiting the use of pound and purse nets in the Hudson river and recommending its passage. Also, on motion of Mr. Joline, Senate bill No. 247 (printed), introduced by Mr. Coggeshall, providing for the more effective organization of game and fish protectors. Also, on motion of Mr. Blackford, Assembly bill, printed No. 718, introduced by Mr. White, in relation to fishing in Cayuga Lake.

On motion the following bills were disapproved and the clerk directed to notify the Legislature to that effect: Assembly bill, printed No. 518, amending chapter 194 of the Laws of 1886, introduced by Mr. Ainsworth. Also, Assembly bill, printed No. 301, introduced by Mr. Talmadge, in relation to the planting of shell-fish in Kings county. Also, Assembly bill, printed No. 512, introduced by Mr. Brundage, amending section 19 of chapter 534 of the Laws of 1879.

On motion, the clerk's accounts were approved.

Commissioners then proceeded to the consideration of applications for franchises in lands under water with the following result:

Unanimously granted in full: No. 58, Aaron Van Name; No. 74, Jeremiah Darling; No. 75, Edmund N. Smith.

Partially granted: No. 79, William Bush; No. 110, William N. Manee.

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Unanimously granted in full: No. 111, heirs of Jacob Manee, all voting aye; No. 113, Edward Kane; No. 122, Albert M. Darling; No. 124, Benjamin Tyler; No. 127, William H. Furman; No. 128, Joseph A. Tyler; No. 130, John M. Tyler; No. 131, E. S. Platt; No. 132, Albert M. Darling; No. 133, Emma J. Tyler and others; No. 206, Oscar L. Decker; No. 222, David D. Decker; No. 224, Sherman Decker; No. 227, Wesley Kingsland; No. 228, Wesley Kingsland; No. 241, T. F. and S. De Hart; No. 248, C. M. Drake; No. 250, David Price; No. 265, Almer Decker; No. 267, Alfred Storer; No. 291, James L. Page; No. 292, James L. Page; No. 294, Nathaniel L. Butler.

Laid on the table: No. 218, W. H. Felch; No. 226, Wesley Kingsland; No. 234, Dower J. Johnston; No. 274, Arthur C. Sofield.

On motion, the applications laid on the table were taken from the table and referred to Commissioners Blackford and Joline, with power to investigate and report.

On motion, the clerk was directed to return the bid of Hiram Monsell, with the information that nothing would be done until after the engineer had surveyed the ground, natural growth.

EDWARD P. DOYLE,
Secretary.

Minutes of meeting held May 7, 1888, at room 310, Potter building.

Present, Commissioners Sherman and Joline.

There being no quorum present, the meeting adjourned to reconvene at the office of R. B. Roosevelt, 7 Wall street, New York, at 11.30 A. M. the same day.

EDWARD P. DOYLE,
Secretary.

Minutes of adjourned meeting held at the office of Robert B. Roosevelt, 7 Wall street, New York, May 7, 1888.

Present, Commissioners Roosevelt, Sherman, Bowman, Blackford and Joline.

President Roosevelt in the chair.

Minutes of meetings of April second and May seventh read and approved.

On motion of Commissioner Sherman, it was unanimously

Resolved, That the counties of Cayuga and Seneca be taken from the fourteenth protection district and restored to the thirteenth protection district.

Commissioner Bowman presented the application of William R. Nelson, of Fort Ontario, N. Y., for a permit to use nets in Deer creek.

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On motion, the clerk was directed to write Mr. Nelson that the commissioners have no power to grant permits.

The clerk presented a communication from George W. Whitaker, game protector, requesting the commissioners for certain expenses incurred by him in the official discharge of his duties.

On motion, the communication was referred to the clerk, with instructions to write the Attorney-General as to the power of the commissioner in the matter.

The clerk presented the reports of the game protectors from fourteen districts — the fifth and twelfth district reports not having been received.

On motion, the reports were referred to General Sherman.

Commissioners Blackford and Joline reported favorably on the applications referred to them at the meeting of April second, and the applications were then considered by the commissioners with the following result:

Application No. 234, Dower J. Johnson, favorably, all the commissioners voting aye; No. 218, W. H. Felch, favorably, all the commissioners voting aye; No. 274, A. C. Sofield, favorably, all the commissioners voting aye; No. 226, Wesley Kingsland, favorably, all the commissioners voting aye.

Applications of W. J. Gaynor, John H. Vreeland, John K. Powell, Peter Sutter and Henry H. Adams were objected to and were referred to the engineer and clerk, with instructions to have applications made in proper form.

On the report of Commissioner Sherman and upon motion, the clerk was directed to send certificates to the fourteen game protectors.

On motion, it was

Resolved, That W. G. Ford, Jr., be employed as engineer of the commission at a salary of $2,400 per year, payable out of the appropriation made for surveying individual shell-fish tracts.

On motion, the engineer was authorized to make application for the loan of a vessel from the United States government.

On motion, the bill of the Marvin Safe Company of $350, for a new safe, was ordered paid.

Several applications for appointment as game and fish protectors were referred to General Sherman.

On motion, leave of absence was granted the clerk.

On motion, Mr. Ford was authorized to apply to Mr. Blackford for directions as to the conduct of his work.

On motion, meeting adjourned, subject to the call of the chair.

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Minutes of regular monthly meeting of the Commissioners of Fisheries, held at the State hatchery at Caledonia, New York, Monday, June 4, 1888.

Present, Commissioners Blackford, Bowman and Joline.

On motion, Commissioner Blackford was elected chairman *pro tem.*

Minutes of last meeting read and approved.

On motion, the game protectors' certificates were referred to General Sherman to be examined and approved.

On motion of Commissioner Bowman it was,

Resolved, That Commissioner Joline and the secretary be given full power to arrange for the compilation, editing, printing and distribution of the game laws of the State and the laws for the preservation of forests as directed by the Legislature of the State.

The commissioners then proceeded to the consideration of applications for franchises with the following result:

Application No. 245, Philip De Waters, favorably, all votion aye; No. 280, John E. Merritt, favorably, all voting aye; No. 305, Henry De Hart, favorably, all voting aye; No. 346, William Post, favorably, all voting aye; No. 318, Henry H. Adams, favorably, all voting aye; No. 319, Benjamin Rausch, favorably, all voting aye; No. 320, John H. Vreeland, favorably, all voting aye; No. 321, John K. Powell, favorably, all voting aye; No. 323, William J. Bennett, favorably, all voting aye; No. 324, D. L. Van Horn, favorably, all voting aye; No. 325, William J. Gaynor, favorably, all voting aye.

On motion, the clerk was authorized to advertise for bids on application Nos. 304 and 308, according to rule No. 26.

On motion of Commissioner Bowman all applications for appointment as game and fish protectors were referred to Commissioner Sherman.

Commissioner Blackford brought the attention of the commissioners to the desire of the Pennsylvania commissioners that New York coöperate with Pennsylvania in establishing a fish-way in the dam across the Delaware river at Lackawaxen.

On motion, the matter was referred to Commissioner Blackford with power to investigate and report.

Commissioner Blackford reported the completion of the new hatchery at Cold Spring harbor. The hatchery had been examined by himself and Commissioner Sherman and had been found most satisfactory. The total cost was $4,998.89.

On motion, the report was adopted and the committee discharged.

On motion, meeting took a recess until 7 o'clock.

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MONDAY, *June* 4 — 7 P. M.

No quorum. Adjourned, subject to the call of the chair.

EDWARD P. DOYLE,
Secretary.

Meeting of the Commissioners of Fisheries held Wednesday, June thirteenth, at the rooms of the commission, 311 Potter building, New York city.

Meeting called to order by Chairman *pro tem.* Blackford.

Present, Commissioners Blackford, Sherman and Joline.

Minutes of last meeting read and approved.

On motion, it was

Resolved, That James A. Shanahan, Superintendent of Public Works of the State of New York, be and hereby is authorized to act in behalf of the Commissioners of Fisheries of the State of New York in locating and building a McDonald fish-way in the State dam across the Hudson river, at Troy, in such a manner and of such materials as he may deem proper.

On motion of Commissioner Joline,

Resolved, That there be paid out of the appropriation remaining in the hands of Commissioner Sherman for the necessary incidental expenses of the Commissioners of Fisheries in the discharge of their duties under chapter 317, Laws of 1883, the sum of $102.50, being for the expenses incurred by the said commissioner in his defense in a suit brought against William N. Steele, Edward L. Sargent and himself for the value of certain nets destroyed by the said William N. Steele, as game and fish protectors, in which judgment was given for the said Commissioner Sherman, as one of the defendants in the case; as per voucher hereto attached.

On motion, meeting adjourned subject to the call of the chairman, *pro tem.*

EDWARD P. DOYLE,
Secretary.

Special meeting Commissioners of Fisheries, held June 27, 1888, at the rooms of the Forestry Commission, Albany, N. Y.

Present, Eugene G. Blackford, chairman *pro tem.*, William H. Bowman and A. Sylvester Joline.

On motion, the reading of the minutes of last meeting was dispensed with.

The application of Kirk Underhill, No. 204, was then considered and granted; all the commissioners voting aye.

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On motion, the commissioners adjourned to meet Friday, July sixth, at the rooms of the Forestry Commission, Albany, N. Y.

EDWARD P. DOYLE.

Minutes of special meeting of the Commissioners of Fisheries held Friday, July 6, 1888, at the rooms of the Forestry Commission, Albany, N. Y.

Present, Commissioners Sherman, Blackford, Bowman, Joline and Burden.

The meeting was called to order by Commissioner Blackford, chairman *pro tem.*, who welcomed Commissioner Burden, and announced that the business before the commission was the election of a president.

Before proceeding to a ballot, the minutes of meetings held June second and twenty-seventh were read and approved.

On motion, an informal ballot was ordered, and the Secretary directed to act as teller.

Several ballots were taken, and then, on motion of Commissioner Sherman, Commissioner Blackford was elected president of the commission.

The commissioners then proceeded to the consideration of applications for shell-fish franchises, with the following results:

Application No. 103, N. S. Ackerly, favorably, all the commissioners voting aye; No. 108, Henry Skidmore, favorably, all the commissioners voting aye; No. 123, Benjamin and Edward Tyler, favorably, all the commissioners voting aye; No. 125, Charles Tyler, favorably, all the commissioners voting aye; No. 105, Edward Pidgeon, favorably, all the commissioners voting aye; No. 101, James Cockroft, favorably, all the commissioners voting aye; No. 129, J. M. and J. J. Tyler, favorably, all the commissioners voting aye; No. 102, Edwin M. Royley and others, favorably, all the commissioners voting aye; No. 138, Ebenezer Bryant, favorably, all the commissoners voting aye.

On motion, a recess was taken.

4.15 P. M.

The commissioners reconvened and proceeded to consider the report of Commissioner Sherman on the applications for appointment as game and fish protectors.

The report, which upon motion was received, was as follows:

To the Board of Commissioners of Fisheries:

The undersigned, to whom was referred the subject of the appointment of game and fish protectors, respectfully reports that from the most careful examination he has been able to make of the character

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and qualifications of candidates, he has come to the conclusion that the following named members of the old force should be reappointed, viz.:

Matthew Kennedy, of Hudson, Columbia county.
Seymour C. Armstrong, of Riparius, Warren county.
John Liberty, of Elizabethtown, Essex county.
Peter R. Leonard, of Ogdensburgh, St. Lawrence county.
Thomas Bradley, of Rockwood, Fulton county.
Frederick P. Drew, of Washington Mills, Oneida county.
William M. Steele, of Clayton, Jefferson county.
Henry C. Carr, of Union Springs, Cayuga county.
John Sheridan, of Penn Yan, Yates county.
George M. Schwartz, of Rochester, Monroe county.

And that the following persons not heretofore belonging to the force should be also appointed, viz.:

William Kidd, of Newburgh, Orange county.
George Moyer, of Lowville, Lewis county.
Charles Ripson, of Niagara county.

Respectfully.

R. W. SHERMAN.

After the reading of the report the following game and fish protectors were, upon motion, unanimously appointed, all the commissioners voting aye upon each appointment: Willett Kidd, Matthew Kennedy, Seymour C. Armstrong, Francisco Wood, Peter R. Leonard, Thomas Bradley, Frederick P. Drew, William N. Steele, Henry C. Carr, John Sheridan, George M. Schwartz, Charles Ripson, George Moyer.

The appointment of chief protector was laid on the table until the next meeting, and all applications for appointment as protector, in what was formerly the first district, were referred to Commissioners Blackford and Joline.

On motion the secretary was directed to notify the protectors of their appointment, and to inform them that, until the appointment of the chief game and fish protector, they should make their reports to the secretary of the commission.

On motion, the meeting adjourned.

EDWARD P. DOYLE,
Secretary.

Regular monthly meeting of Commissioners of Fisheries, held at their office in the Potter building, N. Y., Monday, August 6, 1888.

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Present, Commissioners Blackford, Bowman, Joline and Burden. President Blackford in the chair.

On motion, minutes of special meeting of July sixth were read and approved.

The secretary presented the bonds of the following named fish and game protectors, appointed at the last meeting, filed in accordance with the provisions of chapter 577, Laws of 1888, viz.: Charles Ripson, George Moyer, Henry C. Carr, Peter R. Leonard, John Sheridan, Francisco Wood, Thomas Bradley, Willett Kidd, W. N. Steele, George M. Schwartz, Matthew Kennedy.

On motion, bonds were approved.

The secretary presented the reports of the game and fish protectors for the month of July.

On motion of Commissioner Bowman, they were referred to President Blackford, with power to approve and cause certificates to be issued.

The commissioners then proceeded to the consideration of applications for oyster franchises with the following results, viz.:

Application No. 107, Clarence S. Green, favorably, all voting aye; No. 126, George E. Call, favorably, all voting aye; No. 380, F. W. Brown, favorably, all voting aye; No. 106, O. & M. G. Bartow, favorably, all voting aye; No. 352, Charles Morse, favorably, all voting aye; No. 92, Andrew Ackerly, favorably, all voting aye; No. 104, Joseph S. Lewis, favorably, all voting aye; No. 249, David Price, favorably, all voting aye; No. 24, Winant W. Weir, favorably, all voting aye; No. 158, Roscoe Bishop, favorably, all voting aye.

The secretary then presented the bid of Hiram Monsell, Brookhaven, L. I., for a certain plot of land in Long Island sound, near Easton's Neck, natural growth bed. Said land being unoccupied and having been advertised for sale pursuant to Rule 26 of the Commissioners of Fisheries.

No other bid having been received, Mr. Monsell's bid was accepted and a franchise was granted him for the entire plot of 250 acres of his bid of one dollar and twelve and one-half cents per acre.

The engineer called the attention of the commissioners to the unoccupied avalable lands under water in Little Neck bay and stated there were thirty acres in a condition to be sold.

On motion, the secretary was directed to advertise the plot for sale, in separate and distinct lots of about two and one-half acres each.

Commissioner Bowman reported that he had ordered jars and had made certain preparations for hatching white fish.

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On motion, his action was approved, and a committee, consisting of himself and Commissioner Burden, was appointed to take charge and continue the work.

Commissioner Bowman also spoke at some length concerning the hybrid white fish now being caught in Lake Ontario, and described the successful hatching of muskallonge at Chautauqua lake, by Mr. Mason.

Commissioner Blackford reported that work was begun upon the fish-way for the Troy dam, and that Commissioner Burden had been made an inspector by the Superintendent of Public Works for the purposes of this work.

Commissioner Bowman reported upon the purchase of additional land for the hatchery at Caledonia, and said that the affair had been settled and the deed executed.

Commissioner Blackford reported, from the committee to whom was referred all applications for appointment as game and fish protectors in what was formerly the first district, and asked for additional time, which, upon motion, was granted.

Commissioner Bowman moved that the papers in the matter of the appointment of a chief protector lie upon the table until the next meeting. Carried.

Commissioner Blackford reported that Attorney-General Tabor had complained of illegal fishing in the vicinity of the Thousand Islands. He had at once directed Protector Schwartz to proceed to the spot and enforce the law. Protector Schwartz had at once done so, and President Blackford desired to express to the commissioners his appreciation of Protector Schwartz's energy and skill. A large number of nets had been captured and the trip had been a marked success.

Commissioner Bowman brought up the question of the maintenance of the Fulton chain hatchery.

On motion referred to Commissioners Bowman and Sherman.

Upon motion, Commissioners Joline and Blackford were appointed a committee with power to employ two clerks to act as recorders for the engineer.

Moved and carried, that when the commissioners adjourn, they adjourn to meet at Caledonia, New York, Thursday, August 9.

On motion, Superintendent F. Mather of Cold Spring harbor, was invited to attend the meeting at Caledonia, as guest of the commission.

On motion, meeting adjourned.

EDWARD P. DOYLE,
Secretary.

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Minutes of special meeting of the Commissioners of Fisheries, State of New York, held at Caledonia, N. Y., August 9, 1888.

Present, Commissioners Sherman, Bowman and Burden.

Meeting organized by the election of Commissioner Bowman chairman *pro tem.*

Minutes of the meeting held August sixth were read and approved.

General Sherman offered the following resolution, which, upon motion, was adopted:

Resolved, That the experiment of stocking the St. Lawrence waters through the medium of the private hatcheries of M. B. Hill, at Clayton, which for the last three years has been mainly supported from the appropriations of the commission, has not proved such a success as to warrant a continuance of the expenses and that all the results that have been obtained may be obtained through the source of the Caledonia hatchery without any additional expense. It is, therefore, ordered that the payments heretofore authorized to be made towards the support of the Clayton hatchery cease at the termination of the present month.

On motion, the secretary was directed to send Mr. Hill a copy of this resolution.

Commissioner Sherman offered the following resolution, which, upon motion, was adopted:

Resolved, That E. T. Boehm be and he is hereby appointed superintendent of the new hatchery in progress of erection at Mill creek in the county of Hamilton, which hatchery shall be known by the name of the Sacandaga hatchery. Such superintendent to receive for his services the compensation of seventy-five dollars per month, and his subsistence, the term of office to commence on the first day of October next and to continue during the pleasure of this commission. That Mr. Boehm be directed to repair to Mill creek on or before the fifteenth of the present month, and to do such work in the preparation of the hatchery for service as he shall find necessary and to be paid for such service the same rate of wages that he now receives as an employé of the Caledonia hatchery.

Commissioner Sherman offered the following resolution, which, upon motion, was adopted:

Resolved, That service be continued at the Fulton chain hatchery from and after the fifteenth of this present month. That E. M. Marks be appointed superintendent of such hatchery, to hold during the pleasure of this commission, and to be paid seventy-five dollars per month, and his subsistence, for such service, and that he be authorized to lease of the present holder, the cottage, furniture and appurte-

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nances at such hatchery known as the Lambert cottage till the first day of June next, at a rental of not exceeding twelve dollars per month.

Commissioner Sherman offered the following resolution, which, upon motion, was adopted:

Resolved, That the superintendents respectively of the Caledonia, Adirondack and Sacandaga hatcheries be directed to employ a sufficient force to send to the great upper lakes to gather spawn of salmon trout for the supply of their hatcheries for the approaching hatching season, and that the force so sent from the Caledonia hatchery be directed also to obtain white fish spawn for the service of that hatchery.

Commissioner Sherman presented the name of Frederick P. Drew as a candidate for Chief Game and Fish Protector, and read a number of letters of indorsement.

On motion, the papers, together with the other papers relating to the Chief Game and Fish Protector, were ordered to lay on the table until the next meeting.

Jonathan Mason, one of the employés at Caledonia, by request of Commissioner Sherman, gave an interesting account of the hatching of muskallonge at Chautauqua lake in April last. He thought an appropriation of $1,000 would be needed to continue the work there next year. He also gave some interesting statistics regarding shad culture in the Hudson.

Commissioner Sherman presented abstract B of expenditures incurred in building the new hatchery at Mill creek.

On motion, abstract was approved.

Recess was then taken until 6 o'clock.

Meeting reconvened at 6 o'clock.

On motion, it was ordered that the October meeting be held at Sacandaga hatchery, Mill Creek, Hamilton county, N. Y.

On motion, meeting adjourned.

EDWARD P. DOYLE,
Secretary.

Meeting of the Commissioners of Fisheries, held Thursday, September 4, 1888 at their office in New York city.

Present, Commissioners Blackford, Bowman, Sherman, Burden and Joline.

President Blackford in the chair.

The minutes of meeting held August 9, 1888, at Caledonia, were read and on motion adopted.

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In response to a request from the chair for reports of committees, Commissioner Bowman, from the special committee on the propagation of white fish, reported progress. He stated that he had purchased hatching jars, and that active work would begin when the season opened.

Commissioner Blackford reported from the special committee on the State dam at Lackawaxen, that nothing as yet had been agreed to in the matter.

Commissioner Burden, from the committee on fish-way at Troy, gave an interesting account of the work done with a description of the new fish-way, and stated that the way would be finished September 5, 1888. He also stated that to comply with the State law, it would be necessary to have notices posted within eighty yards on either side of the fish-way.

On motion, he was authorized to have such notices prepared and posted, the expense incurred to be audited by the Commissioners of Fisheries and changed to the contingent fund.

At this point, Mr. Fred Mather appeared before the commissioners and invited their personal inspection of the new fish hatchery at Cold Spring Harbor, built under his supervision. He spoke at length as to his investigations regarding salmon in the Hudson river and offered the commission a duplicate of his report in the matter to the United States Fish Commission.

An informal discussion followed, but no action was taken by the commission.

The commissioners then proceeded to the consideration of applications for franchises in lands under water with the following result:

Application No. 285, Amanda Tufts, favorably, all the commissioners voting aye. No. 364, Daniel Velsor, favorably, all the commissioners voting aye.

The secretary then presented two sealed bids for a certain plot of land under water in Long Island sound described as follows: Lots Nos. 20, 30, 40, 50, and fractional 60 and 70 of township 717; also lots Nos. 11, 21, 31, and fractional 41 and 51 of township 718; in all about eighty-seven acres just northwest of Eaton's Neck, Long Island sound. Said land being unoccupied and having been advertised for sale pursuant to rule 26, rules of the Commissioners of Fisheries.

The president opened the bids and announced that George W. Jenkins of Cold Spring Harbor had bid a lump sum of $100 for the eighty-seven acres, and that Jesse E. Ketchum had bid two dollars and five cents per acre for the lot.

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The bids not being in exact accordance to the terms of the advertised property, the whole was on motion referred to President Blackford to investigate and ascertain if readvertisement was necessary.

The secretary presented a report on the hatching of muskallonge, prepared by Mr. C. K. Green.

On motion of Commissioner Sherman, the report was ordered to be incorporated in the annual report.

On motion of Commissioner Burden, it was

Resolved, That Commissioner Sherman be authorized to confer with the St. Lawrence Anglers' Association and the people of Chautauqua lake in regard to the question of the artificial propagation of muskallonge, and to assure the parties interested of the active coöperation of the commission. It is desired, however, that the land and building necessary should be furnished by private subscription, and when that is done the commission will furnish and operate the same.

Commissioner Sherman offered the following resolution, which, upon motion, was adopted:

Resolved, That it be referred to a committee of two members of the board to consider what measures may be necessary to secure a uniform system of keeping the records and accounts of the respective hatcheries and of regulating and accounting for their expenditures and for the distribution of their fish products, and also to consider what other measures may be desirable to secure a responsible and economical expenditure of appropriations, and to report to the full board such a system in the premises as in their judgment will accomplish the best results.

Commissioners Sherman and Burden were appointed as such committee.

The engineer having announced that there was no discrepancy between the bids and the advertisement in the matter of the sale of land under water in Long Island sound, Commissioner Blackford reported the whole matter back for the consideration of the board, and upon motion the bid of Jesse E. Ketchum for two dollars and five cents per acre being the highest bid received was adopted, and by a yea and nay vote, all the commissioners voting yea, a franchise was granted him.

Commissioner Sherman offered the following resolution, which, upon motion, was granted:

Resolved, That in the designation of chief game protector this board will take into consideration only the practical merits of the candidates, and that as between those who have had no experience as protectors and those whose qualifications have been tested by such experience,

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preference should be given to the latter, all other considerations being equal.

The commissioners then went into executive session, and after several informal ballots unanimously appointed Frederick P. Drew Chief Game and Fish Protector of the State.

The vacancies in the force of game and fish protectors were then filled by the appointment of Major J. W. Pond, of Malone, N. Y., and of Robert Brown, Jr., Port Richmond, S. I., N. Y.

On motion, the clerk was directed to report at each meeting the moneys received by him for franchises and from other sources and his disposition of such moneys.

Commissioner Bowman offered the following resolution, which, upon motion, was adopted:

Resolved, That Monroe A. Green be employed as superintendent of Caledonia hatchery, his appointment to date from September first, and that the question of his compensation be referred to a committee consisting of two members of the board.

The president appointed as such committee Commissioners Bowman and Burden.

Commissioner Sherman gave notice that at the next meeting of the commission he would move to amend the rules so as to change the day of meeting of the commission from the first Monday to the first Tuesday of each month, except such first Tuesday shall be a legal holiday, in which case the meeting day to be the next Wednesday.

Commissioner Bowman offered the following resolution, which, upon motion, was adopted:

Resolved, That the next meeting of the Commissioners of Fisheries be held at the rooms of the commission in New York, and that immediately after such meeting the members of the commission visit Sacandaga hatchery.

On motion of Commissioner Sherman, it was unanimously

Resolved, That in the death of Seth Green, late superintendent of Caledonia hatchery, and formerly a Commissioner of Fisheries of the State of New York, the State and the Fishery Commission have sustained a serious loss. A devoted and faithful officer of the State and the commission, associated at the beginning with the fish culture of the United States, he made the artificial propagation of fish the object of his life's work, and gave to it all his wonderful energy and ability. His skill and experience were such as to give him the merited title of "Father of Fish Culture in the State of New York." With great executive ability, yet always willing to attend to and perform the most difficult and exacting of detail work, he was in the highest sense a

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model superintendent and official. The commissioners take this official opportunity to express their sincere regret and grief at the death of Superintendent Greene, and to assure his bereaved family of their sympathy with them in their great loss.

Resolved, That a copy of these resolutions be engrossed and sent to the family of the deceased.

On motion the meeting adjourned.

EDWARD P. DOYLE,
Secretary.

Minutes of regular monthly meeting of the Commissioners of Fisheries, held at their office in New York, Monday, October 1, 1888.

Present, Commissioners Blackford, Bowman, Joline and Burden.

President Blackford in the chair.

Minutes of meeting held September 4, 1888, were read and, on motion, adopted.

The clerk then presented a sealed bid for a franchise in a certain plot of land under water in Long Island sound, bound and described as follows:

Bounded on the north by the Eaton's Neck natural-growth bed of oysters, and on the south by the land applied for by Jesse E. Ketchum, and included in the continuations of his lines north, comprising lots Nos. 60, 70, 80, 90 and 100, of township 817, and lots Nos. 51, 61, 71, 81 and 91, of township 818, in all 100 acres, said land being unoccupied and having been applied for by Smith & Thompson, and advertised for sale pursuant to Rule 26 of the Commissioners of Fisheries.

The president directed the clerk to open the bid, which he did, and announced that Smith & Thompson bid one dollar and five cents per acre. There being no other bid, the commissioners by a yea and nay vote, all the commissioners voting yea, accepted the bid and directed that a franchise be issued in the above described property, and upon request of Mr. Thompson, who was present, that it be issued in the name of John E. Smith.

The clerk presented a communication from William M. Negus, secretary of the W. O. D. P. Association, requesting the names of all parties to whom franchises had been granted.

On motion, the clerk was requested to furnish the required information.

By request of President Blackford, Engineer Ford informed the commissioners as to the condition of applications for oyster grounds surveyed by him. He stated that twenty applications would be ready for the next meeting of the commission.

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Commissioner Joline, from the committee in charge of editing and compiling an edition of the game laws of the State, and the laws for the preservation of forests, reported as follows:

The undersigned committee, appointed on the part of the Commissioners of Fisheries to arrange for the compilation and publication of 12,000 copies of the fish and game laws of the State and the laws for the preservation of forests, respectfully report that they employed George Edward Kent, a lawyer in the office of General Horatio C. King, of this city, to edit and compile the laws, and contracted with James B. Lyon, State printer, Albany, for their publication. The work of editing, compiling and indexing was carefully and thoroughly done, and while the committee are not fully satisfied with the typography and binding of the book itself, they believe the edition creditable to the commission and a success. They submit herewith a statement itemized of the expense and the details of distribution:

A. SYLVESTER JOLINE,
EDWARD P. DOYLE,
Committee.

EXPENSE OF EDITION.

George Edward Kent, services	$600 00
John L. Dailey	95 00
Adolph Reisig, typewriting	21 50
James B. Lyon, printing	1,144 79
George Edward Kent, traveling expenses	22 70
A. L. Henthorn, typewriting	8 90
A. K. Sikes	13 20
Edward P. Doyle, disbursements	85 55
	$1,991 64

Appropriation, $2,000.

DISTRIBUTION.

	Copies
Members of the Legislature	20
District attorneys and judges	50
Town clerks	1,00
Daily and weekly newspapers, New York city	4
Supervisors of counties	7
Game protectors	37
Chief protector	5
Commissioners	20

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Fred Mather	25
Game clubs	250
Fish Commissioners of the United States and Canada	120
Miscellaneous	300
	3,137

Commissioner Burden, from the committee appointed to have notices posted at the Troy fish-way, reported that he had had the notices posted and presented bills for the expense.

On motion, the report was adopted and the secretary directed to pay the expense incurred and charged to the contingent fund.

Commissioner Burden, from the committee appointed to arrange for a more systematic method of accounts, etc., reported progress and asked for further time which, upon motion, was granted.

Commissioner Bowman, from the committee appointed to fix the compensation of Monroe A. Green, reported progress and asked for further time, which, upon motion, was granted.

Commissioner Bowman offered the following resolution:

Resolved, That William H. Bowman, the commissioner in charge of Caledonia hatchery, be authorized to expend the sums necessary to construct a road leading from the highway to the grounds of the State hatchery at Caledonia.

On motion, the resolution was adopted.

Commissioner Bowman offered the following resolution, which, upon motion, was referred to Commissioner Sherman:

Resolved, That M. B. Hill, be paid a salary of sixty dollars for month of September, 1888, to be charged to the appropriation set apart for the St. Lawrence hatchery.

The secretary presented the bonds of Frederick P. Drew, Seymour C. Armstrong, J. Warren Pond, Robert Brown, Jr.

On motion,

Resolved, That they lay on the table until the next meeting

The clerk reported that he had received, up to date, $1,214.42 for oyster franchises, of which sum $728.70 were sent to the Comptroller and $485.72 were deposited in bank to the credit of the New York Fishery Commission.

On motion, report was adopted.

Pursuant to notice, Commissioner Bowman called up the resolution offered by General Sherman, at the last meeting, changing the day of the monthly meeting of the commission.

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On motion, it was

Resolved, That the rules be amended, so that the commission meet the first Tuesday of every month instead of the first Monday, unless such Tuesday shall be a legal holiday, in which case the commission shall meet on the following Wednesday.

Commissioner Bowman offered the following resolution, which, upon motion, was adopted:

Resolved, That George M. Schwartz be paid, from contingent fund of the commission, the money expended by him at Stony island, amounting to forty-nine dollars and seventy-four cents.

Commissioner Bowman presented the claims of William N. Steele and William H. Consaul against the commission.

On motion,

Resolved, That the claims be referred to Chief Protector Drew to investigate and report to the commissioners at their next meeting.

Commissioner Bowman presented the bill of Chester K. Green, for services rendered the commission.

On motion,

Resolved, That the claim of Chester K. Green be referred to Commissioners Sherman and Burden to report to the commission at its next meeting.

On motion, meeting adjourned.

EDWARD P. DOYLE.

Minutes of special meeting, Commissioners of Fisheries, held Tuesday, October 9, 1888, at Sacandaga hatchery, Mill Creek, Hamilton county, N. Y.

Present, Commissioners Blackford, Bowman, Sherman and Burden.

President Blackford in the chair.

Minutes of meeting, October 1, 1888, read and, on motion, approved.

The clerk presented the bond of Frederick P. Drew, as Fish and Game Protector, and also his bond as Chief Game and Fish Protector of the State. The bonds being in proper form, with sureties justifying in double the amount required by law, they were on motion approved and ordered filed.

The clerk then presented the bond of Seymour C. Armstrong, J. Warren Pond and Robert Brown, Jr., fish and game protectors, and they were on motion approved and ordered filed.

Mr. Frederick P. Drew, Chief Game and Fish Protector of the State, submitted to the commissioners, for their approval, the division of the

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State into districts, as authorized by law, together with a statement as to the assignment of protectors. His report, which is as follows, was approved, and the districting and assignment duly authorized :

The State to be divided into fifteen districts with the following assignment :

First district.— Richmond, Queens, Kings and Suffolk counties; Robert Brown, Jr., protector.

Second district.— Orange, Ulster, New York, Rockland, Westchester and Putnam counties; Willett Kidd, protector.

Third district.— Columbia, Dutchess, Albany, Rensselaer and Greene counties; Matthew Kennedy, protector.

Fourth district.— Warren, Saratoga and Washington counties; Seymour C. Armstrong, protector.

Fifth district.— Franklin, Clinton and Essex counties; J. Warren Pond, protector.

Sixth district.— St. Lawrence county; Peter R. Leonard, protector.

Seventh district.— Lewis and Herkimer counties, and Hamilton county north of a continuation of the south line of Essex county; George Moyer, protector.

Eighth district.— Fulton and Montgomery, and all of Hamilton county south of a continuation of the south line of Essex county; Thomas Bradley, protector.

Ninth district.— Schoharie, Schenectady, Delaware, Sullivan, Chenango and Broome counties; Francisco Wood, protector.

Tenth district.— Oneida, Madison and Otsego counties; Frederick P. Drew, protector.

Eleventh district.— Jefferson, Oswego, Onondaga and Cortland counties; William N. Steele, protector.

Twelfth district.— Wayne, Seneca, Cayuga, Tioga and Tompkins counties; Henry C. Carr, protector.

Thirteenth district.— Yates, Schuyler, Chemung, Steuben, Allegany and Cattaraugus counties; John Sheridan, protector.

Fourteenth district.— Monroe, Orleans, Genesee, Wyoming, Ontario and Livingston counties; George M. Schwartz, protector.

Fifteenth district.— Niagara, Erie and Chautauqua counties; Charles Ripson, protector.

Mr. Drew, to whom was referred at the last meeting the claims of William A. Consaul and William N. Steele to be reimbursed for certain expenses incurred by them, reported progress and asked for further time, which upon motion was granted.

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Commissioner Bowman offered the following resolution, which upon motion was adopted:

Resolved, That Hon. Charles F. Tabor, Attorney-General of the State of New York, be requested by the Commissioners of Fisheries of the State of New York, to bring an action of appeal from the decision of Hon. Pardon C. Williams, justice of the Supreme Court, fifth judicial district, declaring certain portions of chapter 13, Laws of 1883, unconstitutional and take any further action as in his judgment he shall deem proper. And if any appeal action has already been brought by William N. Steele and others through their attorney, E. R. Brown, Esq., Watertown, N. Y., that said Attorney-General be requested to assist said E. R. Brown, Esq., as counsel on the argument of said appeal.

Commissioner Sherman offered the following resolution which, upon motion, was adopted:

Resolved, That an invitation be extended to the grand jury of Hamilton county (now in session) to visit the new hatchery of this commission, known as Sacandaga hatchery, on Mill creek, Hamilton county.

Chief Protector Drew presented a communication from Thomas O'Flynn, requesting permission to fish for bull-heads and suckers in O'Flynn's bay, St. Lawrence river.

On motion of Commissioner Bowman, it was ordered that the communication be referred to Chief Protector Drew, with power to investigate and grant such permission should it appear that the commissioners are given discretion under the law, his action to be reported to the commissioners at their next meeting for confirmation.

Mr. Drew called the attention of the commissioners to the difficulty he had experienced in endeavoring to obtain desk-room at Albany, and the matter was, on motion, referred to Commissioners Bowman and Burden.

Commissioner Sherman, from the committee appointed to prepare a uniform system of accounts, etc., reported as follows:

RULES AND REGULATIONS FOR THE CONDUCT OF THE PRACTICAL OPERATIONS OF THE COMMISSIONERS OF FISHERIES OF THE STATE OF NEW YORK.

First. Regular meetings of the Board of Commissioners are held at its office, in the city of New York, on the second Tuesday of each month, at the hour of 10 o'clock A. M., except when such Tuesday shall occur on a public holiday, in which case the meeting shall be held on the next succeeding day. Extra meetings may be held on the call of the president whenever, in his judgment, they may be neces-

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sary. At least two days notice, personally or by mail, shall be given of each extra meeting, and the particular object of the meeting shall be specified in the notice.

Second. The business of each meeting shall be in the following order:

1. Reading record of proceedings of previous meeting.
2. The consideration of bids for oyster franchises.
3. New business connected with oyster beds.
4. Unfinished business connected with oyster lands and franchises.
5. Auditing of abstracts and accounts.
6. Reports from superintendents.
7. Reports from committees.
8. Communications in writing from persons not connected with the commission.
9. Resolutions.
10. Unfinished business.

Third. Each hatchery station of the commissioner shall be under the direction of a commissioner or commissioners in charge to be named by the board, who shall, subject to its order, direct the superintendent in the discharge of his duties. The salaries of the several superintendents shall be fixed by the board. The number and compensation of the minor employés shall be fixed by the superintendent, subject to the approval of the commissioner in charge.

Fourth. No expenditure other than for the current support shall be made by any superintendent without the approval, previously obtained, of the commissioner in charge; and no expenditure for new structures shall be made at any of the hatcheries without the approval, previously obtained, of the board of commissioners.

Fifth. Each superintendent shall give a bond, with surety, in the sum of $500, subject to the approval of the board, for the faithful discharge of his duties and the accounting by vouchers satisfactory to the Comptroller of all State funds coming to his hands.

Sixth. Payments of the salaries, wages and other expenses shall be made at each hatchery on the fifteenth day of each month, except when such day occurs on Sunday, in which case the next succeeding day shall be pay-day.

Seventh. The superintendent may give on his own responsibility in the interim between the first and fifteenth of each month his receipts for executed vouchers for the expenses of the work in his charge, payable when he shall receive returns from his monthly abstract.

Eighth. All abstracts, accounts or vouchers connected therewith shall be made in duplicate and shall be in accordance with the regulations prescribed by the Comptroller; one copy of each voucher

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shall be included with each abstract, the remaining copy shall be retained by the superintendent. The superintendent shall keep a book in which shall be recorded in their order the monthly abstracts. The duplicate abstracts shall be forwarded with the original to the clerk.

Ninth. All abstracts shall be made up complete by the third of each month, and shall be first sent, with the vouchers accompanying, to the commissioner in charge, who shall examine the abstract as to form and substance, and, if he finds it to be defective in any respect, he shall return it to the superintendent for correction. He shall also examine the vouchers as to the reasonableness of any charges that may be made in them; and, if he finds that any expenditures have been made without proper reference to economy, he shall adopt such measures as he shall deem requisite to secure a correction. The abstract, received by any commissioners in charge, shall be promptly examined by such commissioner, and, when approved by him, shall be forwarded to the clerk of the commission to be presented to the board.

Tenth. The clerk shall prepare blank forms of abstracts, to be approved by the Comptroller, which shall be furnished each hatchery and used by himself in all abstracts of contingent expenses of the commission he may have occasion to make up.

Eleventh. The clerk shall keep in a book, printed for that purpose, a record of the monthly abstracts as they may be audited by the board.

Twelfth. Till further order the following assignments are made, pursuant to Rule 3 of this series:

The Cold Spring hatchery, Commissioner Blackford.

Adirondack hatchery, Commissioner Sherman.

Sacandaga hatchery, Commissioner Burden.

Fulton Chain hatchery, Commissioner Sherman.

Caledonia hatchery, Commissioner Bowman.

And to Commissioner Bowman is also assigned the supervision, as far as any general supervision is necessary, of the spawn gathering in the upper great lakes and the shad hatching in the Hudson river.

And to Commissioner Burden is assigned the supervision of all the fish-ways in the care of the commission:

(This rule shall be printed or written in plain characters on cards and posted in a prominent place in each hatchery.)

Thirteenth. No officer, employé or other person shall bring into building on the grounds of any hatchery station any intoxicating beverages, and any such beverage found on such place by any superintendent shall be summarily removed and destroyed; nor shall

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any officer or employé appear on such grounds in a state of intoxication. No person shall be employed by or in the service of the commission who frequents dram shops or other haunts of vice and immorality. No person shall smoke tobacco in any form in the hatching rooms or work-shops of any hatchery; nor shall any person eject tobacco spittle upon any of the floors, fixtures or furniture of any such building. The penalty for violation of this rule, shall be, in the case of an officer or employé, immediate dismissal from the service of the commission, or from any other person ejection from the building in which the offense shall be committed.

Fourteenth. An inventory of all public property at each hatchery station shall be taken annually on the first day of January. One copy of such inventory shall be retained by the superintendent and duplicate forwarded to the commissioner in charge.

Fifteenth. Each superintendent shall, on or before the fifteenth of February in each year, report to the board a statement in tabular form, of all applications he shall have received for fish fry for the then current season, together with all the papers he shall have touching such applications and no fry shall be furnished from any hatchery till the board shall have made a distributive apportionment.

Sixteenth. Each superintendent shall, between the first and fifteenth of December, in each year, report to the board a detailed account of the operations of the hatchery in his charge for the last year, together with such recommendations touching the conduct of affairs at the station, as he shall deem useful. Such report shall also contain a list of all the employés at the station and a statement of the rate of compensation paid to each.

Commissioner Bowman moved that the report lie on the table until the next meeting, and that the clerk have type-written five copies of the report for the use of the commission. Carried.

Commissioner Bowman, from the committee appointed to fix the compensation of Monroe A. Green, reported that the committee had been unable to agree.

The report of the committee was accepted, and commissioner Bowman offered the following resolution, which upon motion, was ordered to lie on the table.

Resolved, That the compensation of Monroe A. Green, as superintendent of Caledonia hatchery, be fixed at $125 per month.

Commissioner Sherman presented blank form of abstracts, and of receipts, which upon motion were approved and adopted by the commission.

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FORM OF ABSTRACTS.

[Form A.]

COMMISSION OF FISHERIES.

Abstract of vouchers for the necessary contingent expenses of the Commissioners of Fisheries of the State of New York, incurred in the exercise of the duties imposed on them by law, from the..... of ....., 188 *, to the ..... of.....,* 188 *, inclusive.*

For authority of law, see chapter 285, Laws of 1868; chapter 567 Laws of 1870; chapter 309, Laws of 1879; chapter 74, Laws of 1873; and chapter , Laws of 18 (General appropriation act).

DATE.	Number of voucher.	To whom paid.	For what purpose.	Amount.
.....	.....	....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....

STATE OF NEW YORK,
COUNTY OF ..... } ss.:

....., being duly sworn, deposes and says that he is the clerk of the Board of Commissioners of Fisheries, duly appointed by such board and qualified as required by law, that he has advanced and paid the accounts stated in the foregoing abstract, and that the vouchers accompanying said abstract are for such payments and that they are for the necessary incidental expenses of the Commissioners of Fisheries incurred in the performance of their duties under the law, that no part of such payments have been reimbursed to deponent, but that the whole amount thereof is justly due and owing as therein set forth.

Subscribed and sworn to, before me this .... day of ....., 18..

.....

OFFICE OF THE BOARD OF COMMISSIONERS OF FISHERIES,
NEW YORK, ..., 18..

The accompanying abstract of ....., clerk of the Board of Commissioners of Fisheries of payments for the contingent expenses of the said commissioners, having been duly examined by this board, ordered that it be approved, and that the clerk be directed to certify accordingly.

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[Form B.]

COMMISSION OF FISHERIES.

Abstract for the month of ....., 18.., *of vouchers for expenditures incurred in the maintenance* ..... *fish hatchery under the jurisdiction of the Commissioners of Fisheries of the State of New York.*

For authority of law see chapter 285 of the Laws of 1868; chapter 567, Laws of 1870; chapter 309, Laws of 1879; chapter 74, Laws of 1873, and chapter ..., Laws of 18.. (General Appropriation Act).

DATE.	To whom paid.	For what purpose.	Amount.
....	....	....	....
.....	.....	.....	.....
.....	.....	.....	.....

STATE OF NEW YORK, } *ss.:*
COUNTY OF..... }

...., being duly sworn, deposes and says that he is the superintendent of the ..... fish hatchery under the jurisdiction of the Commissioners of Fisheries of the State of New York, holding such position by due authority of the board of commissioners, and that as such superintendent he has incurred and paid the expenditures set forth in the foregoing abstract and the accompanying vouchers, for the maintenance of such hatchery, which were made with care and economy, and that no part of such expenditures have been reimbursed to deponent, but that all are justly due and owing as therein set forth.

Subscribed and sworn to before me, }
this.....day of.....18.... }

.....

OFFICE OF THE BOARD OF COMMISSIONERS OF FISHERIES, }
NEW YORK, ... 18.. }

The accompanying abstract of .....
superintendent of the .....fish hatchery for the month of.....18.., having been duly examined by this board:

ORDERED, That it be approved and that the clerk be directed to certify accordingly.

.....
Clerk.

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[Form C.]

VOUCHER.

.... 1888.

THE FISH HATCHERY.— MAINTENANCE ACCOUNT.

Received payment.

On motion of Commissioner Bowman, it was

Resolved, That the clerk be authorized to procure 1,000 copies of the blank form of abstract submitted by Commissioner Sherman and approved by the commission, marked Form B, and attached hereto to the minutes, and 5,000 copies of the form of voucher submitted and approved and marked Form C, and attached hereto to the minutes.

Commissioner Sherman, from the committee appointed to investigate the claim of C. K. Green, reported by offering the following resolution:

Resolved, That Chester K. Green be paid eighty dollars for services to the Commissioners of Fisheries as per his account rendered.

Commissioner Sherman reported back to the claim of M. B. Hill without recommendation.

On motion of Commissioner Burden, the claim was disallowed, on the ground that Mr. Hill had rendered no service to the commission during the month of September.

The abstract for the month of September, Sacandaga hatchery (maintenance account), was, on motion, approved, and the clerk was directed to certify to the approval on the abstract.

Commissioner Sherman brought up the matter of appropriations for the work of the commission, but no action was taken.

Commissioner Bowman offered the following resolution, which, upon motion, was adopted:

Resolved, That Commissioner Sherman be authorized to procure $3,000 fire insurance on the Sacandaga hatchery.

Commissioner Bowman offered the following resolution, which, upon motion, was adopted:

Resolved, That Commissioner Burden be authorized to take such precaution to insure the State hatcheries against fire as may be necessary, with power to make the requisite expenditure of money.

Commissioner Bowman offered the following resolution which upon motion was adopted:

Resolved, That Commissioner Blackford be authorized to expend at his discretion $500, at Cold Spring Harbor for improvements, the

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amount to be charged to the appropriation to be made for the maintenance of that hatchery.

Commissioner Bowman offered the following resolution, which, upon motion, was adopted:

Resolved, That the matter of appropriations for the different hatcheries be laid over until the next meeting.

Commissioner Sherman gave notice pursuant to the rules that at next meeting of the commissioners he would move to amend the rules so that the day of the regular monthly meeting would be the second Tuesday of each month, instead of the first Tuesday.

Commissioner Blackford presented a petition from the citizens of Hornellsville asking for the appointment of a game and fish protector.

On motion, petition was referred to the chief game protector.

On motion of Commissioner Bowman, it was

Resolved, That the request of the Civil Service Commission for a list of employés be granted and the clerk send such a list.

EDWARD P. DOYLE,
Secretary.

Minutes of meeting of Commissioners of Fisheries, held Wednesday, November 7, 1888, at their office, 311 Potter Building, N. Y.

Present, Commissioners Blackford, Bowman, Burden and Joline.

President Blackford in the chair.

Minutes of meeting held October ninth, read, and on motion adopted.

The following applications for franchises in lands under water for purposes of shell-fish cultivation were considered and by yea and nay vote unanimously granted; each commissioner present voting aye upon every application:

Application No. 289, Nicholas LaForge; No. 373, James L. Page; No. 296, C. and A. Palmer; No. 247, J. B. C. Winant; No. 272, Mrs. E. A. Miller; No. 278, J. F. A. Wagner; No. 414, Frank Joline; No. 306, Matthias DeHart; No. 315, Annie I. Fisher; No. 46, David Joline; No. 314, C. H. Brown; No. 212, Alfred DuBois; No. 257, John E. LaForge; No. 344, Abel Martin; No. 444, John W. Journeay; No. 146, Charles W. Call; No. 389, William N. Manee; No. 362, Albert Verity and brother; No. 153, Croel Depuy; No. 375, R. F. and A. DeHart; No. 250, David Price; No. 50, Elmer Price; No. 120, Abram Martineau; No. 47, David Joline; No. 149, J. J. and David P. Manee; No. 85, John Brinley; No. 57, Alfred DuBois; No. 145, Franklin Van Pelt; No. 89, J. P. Mesereau; No. 161, Jacob Edwards; No. 70, George E. Forrester; No. 98, Garrett Post; No. 398, E. P.

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Manee; No. 77, David W. Van Name; No. 141, David G. Bryant; No. 425, David Wood; No. 243, W. W. LaForge; No. 367, Abram LaTourette; No. 193, John B. Wood; No. 349, G. E. Merrill and G. W. Kinsey; No. 93, Sarah M. Thompson; No. 391, Nathaniel L. Butler; No. 358, A. V. R. Palmer; No. 438, R. C. Meserole; No. 404, Henry Davis; No. 188, Elnathan Hall; No. 408, William Southard; No. 450, Samuel Frost; No. 406, James Southard; No. 411, Charles Valentine; No. 407, Frederick Davis; No. 409, John H. Southard; No. 405, Stephen Valentine.

Commissioner Bowman presented the abstract of expenditures at Caledonia hatchery for the month of October, which upon motion was approved, the clerk directed to sign and forward to the Comptroller.

The clerk presented the abstract of expenditures at Cold Spring Harbor hatchery for the month of October, which upon motion was approved, the clerk directed to sign and forward to the Comptroller.

The clerk presented his own abstract as clerk to the commissioners under chapter 584, Laws of 1887, of expenses and salary for the month of October, which upon motion was approved, the clerk directed to sign and forward to the Comptroller.

The engineer presented the abstract of expenditures in his department for the month of October, which upon motion was approved, the clerk directed to sign and forward to the Comptroller.

Commissioner Bowman presented an application from Hon. Michael C. Murphy for fish to stock Ronkonkoma lake, which upon motion was ordered filed together with the application of John Martin, C. B. Latham and the Ragged Lake Rod and Gun Club.

Mr. Burden, from the committee charged with procuring desk-room for the Chief Game and Fish Protecter, reported progress, and asked for further time, which, upon motion, was granted.

Commissioner Burden, from the committee appointed to take suitable precautions to protect the State hatcheries against fire, reported by recommending the purchase of nine Young Champion fire extinguishers, to cost thirteen dollars each, four of the hatcheries to have two each, and Fulton Chain one.

On motion, the report of the committee was adopted, and the clerk directed to purchase the extinguishers at the price named and forward the same to the respective hatcheries.

By unanimous consent, the question of the adoption of the report of the committee on rules and accounts was laid on the table until the next meeting.

By unanimous consent, the question of the division of the annual appropriation was laid over until the next meeting.

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A communication from a number of gentlemen on Long Island, asking for the appointment of a protector, was ordered filed.

On motion of Commissioner Bowman, it was unanimously

Resolved, That the Chief Game and Fish Protector make a monthly statement to the Commissioners of Fisheries of the work performed in his department.

On motion, meeting adjourned to meet at Cold Spring Harbor hatchery at 10 o'clock Thursday morning, November 8, 1888.

EDWARD P. DOYLE.

Minutes of adjourned regular meeting held at Cold Spring Harbor hatchery, Thursday, November 8, 1888 :

Present, Commissioners Blackford, Sherman, Bowman, Joline and Burden; President Blackford in the chair.

Commissioner Sherman, from the committee appointed to procure insurance on the Sacandaga hatchery, reported that he had placed the insurance desired and filed the policies with the clerk.

Commissioner Sherman presented the abstract of expenditures at the Fulton Chain hatchery for the month of October.

On motion, the abstract was audited an approved, the clerk directed to sign and forward to the Comptroller.

Commissioner Sherman presented the abstract of expenditures for the Sacandaga hatchery for the month of October.

On motion, the abstract was audited and approved, the clerk directed to sign and forward to the Comptroller.

The clerk presented the abstract for contingent expenditures for the month of October.

On motion, the abstract was audited and approved, the clerk directed to sign and forward to the Comptroller.

Commissioner Sherman called up the report of the committee appointed to arrange for a system of accounting which was laid on the table at a previous meeting.

On motion, the report was read section by section and was finally adopted, with amendments.

The rules as amended, are as follows:

RULES AND REGULATIONS FOR THE CONDUCT OF THE PRACTICAL OPERATIONS OF THE COMMISSIONERS OF FISHERIES OF THE STATE OF NEW YORK.

Adopted November 8, 1888.

First.— Regular meetings of the board of commissioners are held at its office, in the city of New York, on the second Tuesday of

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each month, at the hour of 10 o'clock, A. M.; except when such Tuesday shall occur on a public holiday, in which case the meeting shall be held on the next succeeding day. Extra meetings may be held on the call of the president, whenever, in his judgment, they may be necessary. At least two days notice, personally or by mail, shall be given of each extra meeting, and the particular object of the meeting shall be specified in said notice.

Second — The business at each meeting shall be in the following order:

1. Reading of the minutes of the preceding meeting.
2. Consideration of bids for oyster franchises.
3. New business connected with oyster lands.
4. Unfinished business connected with oyster lands and franchises.
5. Reports from engineer, Chief Game and Fish Protector and the superintendents of hatcheries.
6. Auditing of abstracts and accounts.
7. Reports from committees.
8. Communications in writing from persons not connected with the commission.
9. Resolutions.
10. Unfinished business.

Third. Each hatchery station of the commission shall be under the direction of a commissioner in charge to be named by the board, who shall, subject to its order, direct the superintendent in the discharge of his duties. The salaries of the several superintendents shall be fixed by the board. The number and compensation of the minor employés shall be fixed by the superintendent, subject to the approval of the commissioner in charge.

Fourth. No expenditure other than for current support shall be made by any superintendent without the approval previously obtained of the commissioner in charge, and no expenditure for new structures exceeding fifty dollars in cost shall be made at any of the hatchery stations without the approval, previously obtained, of the board of commissioners.

Fifth. Each superintendent shall give a bond with surety in the sum of $500, subject to the approval of the board, for the faithful discharge of his duties and the accounting by vouchers, satisfactory to the Comptroller of all State funds coming to his hands.

Sixth. Payments of salaries, wages and other expenses, shall be made at each hatchery on the fifteenth day of each month, except when such day occurs on Sunday, in which case the next succeeding day shall be pay-day.

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Seventh. The superintendent may give, on his own responsibility, in the interim between the first and fifteenth of each month, his receipts for executed vouchers for the expenses of the work in his charge, payable when he shall receive returns from his monthly abstract.

Eighth. All abstracts, accounts or vouchers connected therewith, shall be made in duplicate and shall be in accordance with the regulations prescribed by the Comptroller. One copy of each voucher shall be included with each abstract, the superintendent shall keep a book in which shall be recorded in their order the monthly abstract. The duplicate abstract shall be forwarded with the original to the clerk.

Ninth. All abstracts shall be made up complete by the third of each month, and shall be first sent with the vouchers accompanying to the commissioner in charge, who shall examine the abstract as to form and substance, and if he finds it to be defective in any respect he shall return it to the superintendent for correction. He shall also examine the vouchers as to the reasonableness of any charges that may be made in them, and, if he finds that any expenditures have been made without proper reference to economy, he shall adopt such measures as he shall deem requisite to secure a correction.

The abstracts received by any commissioner in charge shall be promptly examined by such commissioner, and when approved by him shall be forwarded to the clerk of the commission to be presented to the board.

Tenth. The clerk shall prepare blank forms of abstracts to be approved by the Comptroller, which shall be furnished to each hatchery and used by himself in all abstracts of contingent expenses of the commission he may have occasion to make up.

Eleventh. The clerk shall keep, in a book provided for that purpose, a record of the monthly abstracts.

Twelfth. Until further orders, the following assignments are made pursuant to Rule 3 of this series:

The Cold Spring hatchery, Commissioner Blackford.

Adirondack hatchery, Commissioner Sherman.

Sacandaga hatchery, Commissioner Burden.

Fulton Chain hatchery, Commissioner Sherman.

Caledonia hatchery, Commissioner Bowman.

And to Commissioner Bowman is also assigned the supervision, as far as any general supervision is necessary, of the spawn gathering in the upper great lakes and the shad hatching on the Hudson river.

And to Commissioner Burden is assigned the supervision of all the fish-ways in the care of the commission.

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To Commissioner Joline shall be assigned immediate supervision of the work of the clerk, as far as his work relates to the consideration and granting of applications for franchises in lands under the waters of the State for purposes of shell-fish cultivation.

These rules shall be printed in plain characters on cards, and posted in a prominent place in each hatchery.

Thirteenth. No person shall bring into any building or on the grounds of any hatching station any intoxicating beverages, and any such beverages found in such place by any superintendent shall be summarily destroyed. Nor shall any employé or other person appear on such grounds in a state of intoxication. No person shall be employed in the service of the commission who frequents dram-shops or other haunts of vice or immorality. No person shall smoke tobacco in any form in the hatching rooms or work-shops of any hatchery, nor shall any person eject tobacco spittle upon any of the floors, fixtures or furniture of any such building.

Fourteenth. An inventory of all public property at each hatching station shall be taken annually on the first day of January. One copy of such inventory shall be retained by the superintendent and a duplicate forwarded to the commissioner in charge, to be filed in the office of the Commissioners of Fisheries.

Fifteenth. Each superintendent shall, on or before the fifth day of February in each year, report to the board a statement in tabular form of all the applications he shall have received for fish fry for the then current season, together with all papers he shall have touching such applications, and no fry shall be furnished from any hatchery till the board shall have made a distribution apportionment.

Sixteenth. Each superintendent shall, between the first and the fifteenth of December, report to the board a detailed account of the operation of the hatchery in his charge for the last year, together with such recommendations touching the conduct of affairs at the station as he shall deem useful. Such report shall also contain a list of all employés at the station and a statement of the rate of compensation paid to each.

By unanimous consent, the question of the apportionment of the annual appropriation was laid over until the next meeting.

On motion, the clerk was directed to communicate at once with each hatchery superintendent and obtain from them an estimate in detail of their expenses for the coming year.

On motion, General Sherman was requested to prepare a card for the public informing them when and how fish fry could be obtained for distribution.

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The clerk presented a communication from Chester K. Green, which, upon motion, was ordered read and placed on file.

EDWARD P. DOYLE,
Clerk.

Regular monthly meeting of the Commissioners of Fisheries, State of New York, held Tuesday, December 11, 1888.

Present, Commissioners Blackford, Sherman, Bowman, Burden and Joline.

President Blackford in the chair.

Minutes of meeting held November 8, 1888, read and on motion approved. The clerk presented a sealed bid for a franchise for forty acres of land under water in Long Island sound, described on a map of the Commissioners of Fisheries prepared by W. G. Ford, Jr., engineer, as lots Nos. 1 and 2, township 78 and lots Nos. 9 and 10, township 77, these lots being unoccupied and having been applied for, and being advertised for sale pursuant to Rule 46 of the Commissioners of Fisheries.

The president opened the bid and announced that Ackerly & Thompson had bid one dollar and twenty-five cents per acre for the entire plot. This being the only bid, by yea and nay vote, all the commissioners voting aye, Ackerly & Thompson were granted the franchise.

The clerk presented a sealed bid for a franchise for thirty acres of land under water in Long Island sound described on a map of the Commissioners of Fisheries, made by W. G. Ford, Jr., engineer, as lots Nos. 12, 22 and 32, township 78, Long Island sound. These lots being unoccupied and having been applied for and advertised for sale, pursuant to Rule 46 of the Commissioners of Fisheries.

The president opened the bid and announced that Andrew Ackerly had bid thirty-five dollars for the entire plot. This being the only bid, by yea and nay vote, all the commissioners voting aye, Andrew Ackerly was granted the franchise.

The clerk presented twenty-six sealed bids for franchises in fifty-five plats of land under water in Little Neck bay, each plat containing two and one-half acres and being more fully described in a map of land under water in Little Neck bay made by W. G. Ford, Jr., engineer, and filed in the office of the Commissioners of Fisheries. These plots being unoccupied and having been applied for, and being advertised for sale, pursuant to Rule 46 of the Commissioners of Fisheries.

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The president broke the seals and announced the bids as follows:

	Per acre.
Eben V. Roe, for lot No. 32	$5 00
L. T. Roe, for lot No. 29	5 00
T. M. Smith, for lot No. 19	5 00
C. A. Smith, for lot No. 18	5 00
F. T. Boerum, for lots Nos. 27 and 34	3 00
H. B. Abrams, for lot No. 11	3 00
E. V. Roe, for lots Nos. 54 and 44	10 00
H. B. Abrams, for lots Nos. 26 and 25	5 00
George Bradish, for lots Nos. 39, 40, 41, 42, 43, 48, 49, 50, 51, 52, 53, 54 and west half of 38	5 10
George Bradish, for lots Nos. 44, and 47 and half of 55	10 10
John Webster, for lots Nos. 28 and 33	3 00
C. L. Van Wart, for lots Nos. 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54 and 55	475 00
Albert Click, for lots Nos. 23, 24, 25 and 26, for the plot	40 00
James Butler, for lots Nos. 20, 21 and 22, for the entire plot	40 00
John W. Harway, for lots Nos. 53, 54 and 55, for the entire plot	65 00
John W. Harway, for lots Nos. 46, 47, 48, 49, 50, 51, 52, for the entire plot	85 00
G. H. Smith, for lots Nos. 42, 43, 44, 45, for entire plot	40 00
C. W. Kirkham, for lots Nos. 5, 6, 7, 8, 15, 16, 17, 18, for entire plot	100 00
W. W. Dodge, for lots Nos. 18 and 19	20 00
W. N. Stevens, for lots Nos. 16 and 17	20 00
F. K. Conant, for lots Nos. 8, 9, 10, 11, 12, 13, 14, 15	25 00
J. H. Delfytt, for lots Nos. 38, 39, 40, 41	40 00
W. H. Waldron, for lots Nos. 53, 54, 55	150 00
C. Fowler, for lots Nos. 36, 37	20 00
F. K. Lawrence, for lots Nos. 1, 2, 3, 4, 5, 6, 7	20 00
James Whyte, for lots Nos. 27, 28, 29, 30	40 00
Thomas W. Fowler, for lots Nos. 31, 32, 33	40 00
B. Johnston, for lots Nos. 34, 35	20 00

Commissioner Bowman moved to refer all bids to Commissioners Blackford and Joline to tabulate and investigate and report to the commissioners at an adjourned meeting of the board to be held Wednesday, December twelve, at twelve noon, and that when the commissioners adjourn to meet at this office, Wednesday, December twelve, at twelve o'clock, noon.

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The motion was seconded and carried.

The commissioners then proceeded to the consideration of applications for franchises in lands under water with the following result:

Application No. 326, C. P. Vreeland, favorably, all the commissioners voting aye; No. 317, L. J. Tormey, favorably, all the commissioners voting aye; No. 234, Dower J. Johnson, favorably, all the commissioners voting aye; No. 443, Smith W. DeHart, favorably, all the commissioners voting aye; No. 394, Jacob Deckerson, favorably, all the commissioners voting aye; No. 401, P. E. Schenck, favorably, all the commissioners voting aye.

The engineer presented applications, with the recommendation that they be rejected, the lands to which they referred not being in the jurisdiction of the State.

On motion of Commissioner Bowman it was

Resolved, That the applications be laid on the table and that the clerk notify the applicants that the lands in question were not in State jurisdiction, and that consequently no action could be taken by the commissioners.

On motion of Commissioner Sherman, the report of the engineer was ordered embodied in the annual report and a copy filed in the office of the Secretary of State or State Engineer, Albany.

The clerk presented the report of the Chief Game and Fish Protector.

On motion, it was approved and the clerk directed to embody it in the annual report.

Commissioner Sherman called the attention of the commissioners to the fact that a letter had been received by Commissioner Blackford from the deputy minister of fisheries at Canada, alleging a lack of coöperation in fish protection, on the part of the Commissioners of Fisheries of the State of New York, on the New York side of the St. Lawrence river.

Commissioner Blackford had forwarded the letter to Chief Protector Drew, directing him to investigate and report.

Commissioner Sherman presented the report of Mr. Drew in the matter. The report stated the deputy minister had been misinformed and that the facts were exactly the reverse. The law was enforced on the American side, but there was a lack of coöperation by the authorities on the Canadian side of the St. Lawrence river. The correspondence was referred to Commissioner Blackford.

Commissioner Sherman presented the request of Protector Drew for the board to take action to secure the extradition of Dr. A. G. Bailey, Cleveland, Ohio, convicted in this State of violations of the game laws.

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Commissioner Sherman offered the following resolution, which, upon motion, was adopted:

Resolved, That the Honorable David B. Hill, Governor, be requested to grant requisition papers for the arrest in Ohio, and return to this State, of Dr. A. G. Bailey of Cleveland, Ohio, to answer for the offense for which judgment has been duly recovered against him, this case having been reported to this board by the chief game protector as one of peculiar aggravation and demanding prompt and exemplary action.

The clerk presented the following reports which were read and ordered embodied in the annual report:

Report of Caledonia hatchery, and report of Fulton Chain hatchery.

The clerk presented the following abstracts for the month of November, which upon motion were approved, the clerk directed to sign and forward to the Comptroller.

Caledonia hatchery	$973 40
Cold Spring Harbor hatchery	805 26
Sacandaga hatchery	617 44
Adirondack hatchery	599 79
Fulton Chain hatchery	165 50
Abstract of the clerk for expenses of the shell-fish department,	373 52

General Sherman presented his report as a committee of one in charge of the erection of the hatchery at Mill Creek, which report was, upon motion, approved and ordered embodied in the annual report.

Commissioner Burden, from the committee on fish-ways in the Hudson, reported that he had prepared, with the assistance of the Attorney-General, an agreement to be signed by the mill-owners at Mechanicville, and had forwarded the agreement to them for their signatures.

A communication from M. B. Hill, Clayton, regarding muskallonge.

Upon motion, referred to Commissioners Sheridan and Bowman, with power to visit and inspect his hatchery.

A communication from Henry C. Ford, president of the Fishery Commission of Pennsylvania, regarding the necessity of interstate coöperation.

On motion, referred to Commissioners Burden and Blackford.

Commissioner Sherman offered the following resolution, which, upon motion, was adopted.

Resolved, That Superintendent James H. Marks be directed to proceed to the Michigan State hatchery at Detroit to observe the methods of hatching white fish at that establishment, and that he be authorized to give in exchange for 50,000 white fish eggs received from the Michigan hatchery 5,000 eggs of brook trout from the hatch-

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ery in his charge. The expense of such trip not to exceed $25 and to be charged to the appropriation made to the Adirondack hatchery.

Commissioner Sherman offered the following resolution which, upon motion, was adopted.

Resolved, That the Comptroller be requested to audit the account, which has been already approved by this board, of the Marvin Safe Company for a safe purchased and now in use by the commission, this safe being absolutely necessary for the preservation of valuable records involving, in some cases, the title to land in the custody of the commission.

The clerk presented the annual report of the commission which, upon motion, was approved.

The account of the engineer for $, for the month of November, was, upon motion, approved, the clerk directed to sign and forward to the Comptroller.

On motion of Commissioner Sherman, it was

Resolved, That Commissioner Bowman have the authority to permit the distribution of such spawn as may be spared for the Caledonia hatchery for such private hatcheries as he may be satisfied can safely hatch them for distribution in the waters in the neighborhood respectively of such hatcheries.

On motion of Commissioner Sherman, it was

Resolved, That the consideration of unfinished business be postponed until Wednesday, December 12, 1888.

On motion, the meeting adjourned.

Minutes of an adjourned meeting of the Commissioners of Fisheries, State of New York, held Wednesday, December 12, 1888, at the rooms of the commission in the city of New York.

Present, Commissioners Blackford, Sherman, Burden, Bowman and Joline.

President Blackford in the chair.

On motion, the reading of the minutes of the preceding meeting was dispensed with.

Commissioners Blackford and Joline, to whom were referred the bids for franchises in Little Neck bay for investigation, presented the following report:

First. As to lots Nos. 1, 2, 3, 4, there being but one bidder, F. N. Lawrence, and his bid being so low as to be out of proportion with the bids for adjoining plots, the committee recommended the rejection of the bid.

On motion, and by a yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid rejected.

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As to lots Nos. 5, 6, 7, the committee reported in favor of accepting the bid of C. W. Kirkman, for five dollars per acre.

On motion, by yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

As to lots Nos. 9, 10, 12, 13, 14, the committee reported in favor of accepting the bid of F. K. Conant, for one dollar and twenty-five cents per acre.

On motion, by yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

As to lot No. 11, the committee reported in favor of accepting the bid of H. P. Abrams, at three dollars per acre.

On motion, by yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

As to lot No. 15, the committee reported in favor of accepting the bid of C. W. Kirkman, at five dollars per acre.

On motion, by yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

As to lots Nos. 16 and 17, the committee reported in favor of accepting the bid of W. N. Stevens, at four dollars per acre.

On motion, by yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

As to lot No. 18, the committee reported in favor of accepting the bid of C. A. Smith, at five dollars per acre.

On motion, by yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

As to lot No. 19, the committee reported in favor of accepting the bid of T. M. Smith, at five dollars per acre.

On motion, by yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

As to lots Nos. 20, 21, 22, the committee reported in favor of accepting the bid of James Butler, at five dollars and thirty-three cents per acre.

On motion, by yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

As to lots Nos. 23, 24, 25, the committee reported in favor of accepting the bid of Albert Chick, at four dollars per acre.

On motion, by yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

As to lot No. 26, the committee reported in favor of accepting the bid of H. P. Abrams, at five dollars per acre.

On motion, by yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

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As to lot No. 27, the committee reported in favor of accepting the bid of F. T. Boerum, for three dollars per acre.

On motion, by aye and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

As to lots Nos. 28 and 30, the committee reported in favor of accepting the bid of James Whyte, at four dollars per acre.

On motion, by yea and nay, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

As to lot No. 29, the Committee reported in favor of accepting the bid of L. F. Rowe, at five dollars per acre.

On motion, by yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

As to lots No. 31 and 33, the committee reported in favor of accepting the bid of Thomas W. Fowler, at five dollars and thirty-three cents per acre.

On motion, by yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

As to lot No. 32, the committee reported in favor of accepting the bid of E. V. Rowe, at five dollars per acre.

On motion, by yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

As to lot No. 34, the committee reported in favor of accepting the bid of B. Johnstone, at four dollars per acre.

On motion, by yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

As to lot No. 35, the committee reported in favor of accepting the bid of H. P. Abrams, at five dollars per acre.

On motion, by yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted.

As to lots Nos. 36 and 37, the committee reported in favor of accepting the bid of Cornelius Fowler, at four dollars per acre.

On motion, by yea and nay vote, all the commissioners voting aye, the report of the committee was adopted and the bid accepted,

As to lots Nos. 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, the committee reported in favor of accepting the bid of C. L. Van Wart, at ten dollars and fifty-five cents per acre.

On motion, and by unanimous consent, the report of the committee was disagreed with, and the bids on these fifteen lots recommitted to the committee to investigate and report at the next meeting.

As to lots Nos. 54 and 55, the committee reported in favor of accepting the bid of W. H. Waldron, at twenty dollars per acre.

On motion, and by unanimous consent, the report of the committee

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was disagreed with, and the bids on these lots recommitted to the committee to investigate and report at the next meeting.

The commissioners then proceeded to the consideration of the apportionment of the annual appropriation. Estimates of proposed expenditures were submitted from the various hatcheries and after considerable discussion, Commissioner Sherman offered the following resolution:

Resolved, That the appropriation of the sum of $30,000 made by chapter——, Laws of 1888 (General Appropriation Act), for the general purposes of this commission be apportioned as follows:

For the maintenance of the Caledonia hatchery	$9,000
For the maintenance, including reconstructing of ponds of Cold Spring hatchery	7,000
For the maintenance of Sacandaga hatchery	3,000
For the maintenance of the Adirondack hatchery	4,750
For the maintenance of the Fulton Chain hatchery	2,760
For-shad hatching operations on the Hudson river	1,000
For the experimental work in the propogation of muskallonge at Chautauqua lake or elsewhere, provided an equal sum shall be raised and similarly appropriated by local interest.	500
For the general incidental purposes of the commission	1,500
Reserve fund	500

Commissioner Bowman moved to amend, by making the appropriation for Cold Spring $6,000 and Caledonia $10,000.

The amendment was lost.

The question then recurred on the original resolution, which was adopted by yea and nay vote; Commissioners Blackford, Burden, Sherman and Joline voting aye; Commissioner Bowman no.

Commissioner Sherman offered the following resolution, which, upon motion, was adopted:

Resolved, That the president of this commission be requested to communicate with the fish commissioners respectively of the States adjoining New York, and with the authorities in charge of the subject of game and fish protection of the Dominion of Canada, with reference to the adoption of such a system of protection as shall promise uniform results in the territory embraced, and that this commission pledges itself to do whatever may be in its power to secure for the conclusions of any conference that may be had on this subject a favorable consideration of the New York Legislature.

On motion, meeting adjourned.

EDWARD P. DOYLE,
Clerk.

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FINANCIAL REPORT.

CLERK'S DEPARTMENT.

1887.				
Nov.	7.	John L. Daily, services and expenses....	$20 47	
		John H. Hunt, advertising.....	5 50	
		Staten Island Star, printing.....	30 00	
		O. B. Potter, rent.....	62 50	
		F. W. Devoe & Co., chart table.....	20 00	
		N. I. Quigstad, services.....	70 00	
		Edward P. Doyle.....	125 00	
				$333 47
Dec.	5.	Services of Edward P. Doyle.....	$125 00	
		O. B. Potter, rent.....	30 00	
		Postage and office expenses.....	7 75	
		Wages of errand boy.....	6 00	
		W. P. Mitchell.....	40 00	
		A. S. Barnes & Co.....	49 33	
		John M. Davis.....	50 33	
				308 43
1888.				
Jan.	4.	E. P. Doyle, salary.....	$125 00	
		M. Greenwald, chairs.....	36 00	
		O. B. Potter, rent.....	30 00	
		Wages of errand boy.....	12 00	
		John M. Davis, printing.....	21 25	
		Postage and office expenses.....	8 00	
		Affidavits.....	25 00	
		Messenger service.....	2 25	
		Traveling expenses.....	10 00	
		Affidavits, Long Island.....	8 00	
				277 50
Feb.	6.	B. & O. Telegraph Company.....	$1 24	
		Edward P. Doyle, salary.....	125 00	
		Edward P. Doyle, expenses.....	15 20	
		Edward P. Doyle, office expenses.....	6 00	

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1888.				
Feb.	6.	Edward P. Doyle, disbursements	$33 00	
		Edward P. Doyle, salary of office boy	15 00	
		O. B. Potter, rent	30 00	
				$225 44
March	5.	Edward P. Doyle, salary	$125 00	
		Dennison & Brown, printing	14 25	
		Florence L. Duryea, typewriting	6 15	
		M. Greewald	31 50	
		A. S. Barnes & Co., stationery	10 47	
		O. B. Potter, office rent	30 00	
		Edward P. Doyle, office expenses	5 70	
		Edward P. Doyle, traveling expenses	28 95	
				252 02
April	2.	Edward P. Doyle, salary	$125 00	
		Edward P. Doyle, office expenses	6 97	
		D. C. McMillan, typewriting	1 88	
		Brown Brothers, cabinet	36 90	
		B. & O. Telegraph Company, messenger	4 15	
		O. B. Potter, rent	30 00	
		Edward P. Doyle, traveling expenses	24 20	
		John M. Davis, printing	4 50	
				233 60
May	7.	Edward P. Doyle, salary	$125 00	
		Edward P. Doyle, disbursements	34 23	
		O. B. Potter, rent	62 50	
		Oyster Bay Pilot, printing	52 00	
		Henry Hess, painting sign	6 50	
		Marvin Safe Company, safe	350 00	
				630 23
June	4.	Edward P. Doyle, salary	$125 00	
		O. B. Potter, rent	62 50	
		Edward P. Doyle, disbursements	8 25	
		Edward P. Doyle, disbursements	9 75	
		Manhattan District Telegraph Company,	2 30	
				207 80
July	2.	Edward P. Doyle, salary	$125 00	
		Edward P. Doyle, disbursements	35 60	
		P. Patten, towels and services	17 35	
		O. B. Potter, rent	62 50	
				240 45
August	6.	Edward P. Doyle, salary	$125 00	
		O. B. Potter, rent	62 50	
		Edward P. Doyle, disbursements	77 55	
				265 05

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1888.				
Sept.	4.	Edward P. Doyle, salary	$125 00	
		Edward P. Doyle, disbursements	71 20	
				$196 20
October	1.	Edward P. Doyle, salary	$125 00	
		W. A. Snyder, printing	19 50	
		O. B. Potter, rent	62 50	
		P. Patten, janitor	8 72	
				215 72

CONTINGENT EXPENSE ACCOUNT.

March	1.	Bill of William H. Bowman	$56 57	
		Bill of John M. Gonigal	50 00	
		Bill of Charles Doyle	30 00	
		Bill of A. S. Joline	17 00	
				153 57
May	7.	Charles Doyle, services	$27 00	
		Dennison & Brow, printing	43 00	
		R. U. Sherman, traveling expenses	58 30	
		A. Sylvester Joline, traveling expenses	19 20	
		W. G. Ford, traveling expenses	17 20	
				154 70
June	4.	William H. Bowman, expenses	$31 86	
		Charles Doyle, services	12 00	
		Brown, Green & Adams, printing	5 75	
		Brown, Green & Adams, printing	7 50	
		Edward P. Doyle, disbursements	75 05	
				131 66
July	2.	Edward P. Doyle, disbursements	$36 55	
		Charles Doyle, services	12 00	
		Robert B. Roosevelt, disbursements	14 00	
		Edward P. Doyle, disbursements	7 84	
				70 39
Aug.	6.	Charles Doyle, services	$15 00	
		Brown, Green & Adams, stationery	36 25	
		Edward P. Doyle	57 50	
		W. H. Bowman	91 43	
				179 18
Sept.	4.	Edward P. Doyle, disbursements	$99 48	
		Charles Doyle, services	12 00	
		R. U. Sherman, disbursements	41 59	
		Edward P. Doyle, disbursements	32 90	
				185 97
Oct.	1.	Edward P. Doyle, disbursements	$10 00	
		William H. Bowman, disbursements	65 07	
		Charles Doyle, services	12 00	

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1888.				
Oct.	1.	Henry Burden, disbursements	$41 30	
		Edward P. Doyle, disbursements	16 50	
		Henry Burden, disbursements	39 68	
		Brown, Green & Adams, printing	9 00	
				$193 55
Nov.	7.	C. K. Green, services	$80 00	
		G. M. Schwarts, traveling expenses	49 74	
		Cornish Mailing Agency, wrappers	7 50	
		Knight & Bill, book valise	6 00	
		John L. Daily, services	24 00	
		Charles Doyle, services	15 00	
		A. Reisig, typewriting	12 00	
		Edward P. Doyle, disbursements	135 56	
		Chester K. Green, services	60 00	
		William H. Bowman, disbursements	39 51	
				429 31

CALEDONIA.

Financial statement for fiscal year commencing October 1, 1887, *and ending September* 30, 1888.

MONTH.	Caledonia hatchery.	Fulton Chain hatchery.	St. Lawrence hatchery.	Total.
1887.				
October	$825 89	$171 77	$139 25	$1,136 91
November	1,294 87	245 45	200 09	1,740 41
December	997 72	139 93	80 00	1,217 65
1888.				
January	943 02	129 95	101 25	1,174 22
February	910 80	72 50	120 00	1,103 30
March	887 51	196 87	125 20	1,209 58
April	1,045 98	75 00	80 00	1,200 98
May	1,006 29	197 05	95 51	1,298 85
June	1,412 47	26 93	94 00	1,533 40
July	1,016 36	.....	80 00	1,096 36
August	927 60	45 00	80 00	1,052 60
September	713 14	213 14	.....	926 27
Total	$11,981 65	$1,513 58	$1,195 30	$14,690 53

Amount appropriated for Caledonia hatchery	$13,000 00
Amount expended during fiscal year	11,981 65
Balance unexpended	$1,018 35
Amount appropriated for Fulton Chain hatchery	$1,500 00
Amount expended during fiscal year	1,513 58
Expended in excess of appropriation	$13 58

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Amount appropriated for St. Lawrence hatchery	$1,550 00
Amount expended during fiscal year	1,195 30
Balance unexpended	$304 70

Respectfully submitted.

CHESTER K. GREEN.

COLD SPRING HARBOR.

ABSTRACT FOR DECEMBER, 1887.

Superintendence.

Fred Mather, Superintendent, one months salary		$125 00

Labor of employés.

Peter Gorman, 23 days labor, at $1.50	$34 50	
Wm. Holmes, 18¾ days labor, at $1.50	28 13	
Geo. A. Mason, 19¼ days labor, at $1.50	28 87	
John C. Totten, carting sand	15 00	
		106 50

Express charges and freight.

Michigan Pipe Company, Bay city, Michigan, express on iron fittings	$0 90	
Long Island railroad, freight on wooden pipe from Michigan	46 10	
J. C. Totten, cartage on pipe from station	5 00	
Long Island express, report to Secretary Thompson	25	
Long Island express, lake trout eggs from Michigan	1 00	
		53 25

Fish food.

Louis Bennett, six bushels mussels, at 15 cents		90

Miscellaneous.

Michigan Pipe Company, wooden water-pipe	$174 05	
McEwan & Co., lumber for various use	78 63	
Postage stamps	2 50	
Box of paper fasteners	40	
Fee of Notary Public	12	
		255 70
Total		$541 35

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ABSTRACT FOR JANUARY, 1888.

Superintendence.

Fred Mather, superintendent, one months salary		$125 00

Labor of employés.

Peter Gorman, 25 days labor, at $1.50		37 50

Traveling expenses.

Fred Mather, expenses to New York for supplies		3 15

Express charges and freight.

American express, lake trout eggs from Michigan to New York	$4 75	
Long Island express, lake trout eggs from Michigan to New York	30	
Long Island railroad, iron pipe from New York	1 00	
Long Island express, saibling eggs from Germany	1 60	
Long Island express, box of brass cocks from New York	25	
Long Island express, box of sundries from Eimer & Amend	25	
Long Island express, box of thermometers from New York	25	
		8 40

Fish food.

Louis Bennett, five bushels of mussels at 15 cents		75

Miscellaneous.

W. H. Stoyle, cutting threads on iron pipe	$2 70	
Fred. Adee & Co., 15 air-cocks	6 00	
Eimer & Amend, sundries	7 07	
Eimer & Amend, thermometers	6 43	
J. N. Collins & Co, twenty window shades	19 20	
Wood & Carll, cement, $9.75; coal, $14.50; lumber, $32.00	56 25	
E. G. Blackford, postage and telegrams	3 19	
Henry C. Bunce, spar for flagstaff	5 00	
Postage stamps	2 00	
Fee of notary public	25	
		108 09
Total		$282 89

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ABSTRACT FOR FEBRUARY, 1888.

Superintendance.

Fred Mather, superintendent, one months salary		$125 00

Labor of employés.

Geo. Sprage, mason work on engine house	$12 92	
Peter Gorman, 5 days labor, at $1.50	7 50	
		20 42

Express charges and freight.

Long Island railroad, freight on wire cloth	$0 56	
Long Island express, stove grate	25	
Long Island express, tools from New York	50	
Long Island express, tools from New York	30	
Long Island express, box of fish	25	
		1 86

Fish food.

Louis Bennett, 10 bushels mussels, at 15 cents		1 50

Miscellaneous.

H. G. Cornell, stenography for E. G. Blackford	$5 73	
Richardson & Boynton company, stove grate	90	
Telegram to Rowland Redmond	29	
Howard & Morse, wire-cloth	46 43	
Chas. E. Little, tools and hardware	22 87	
Simon Hirschfield, six wooden chairs	4 20	
Chas. E. Little, tools	9 35	
E. G. Blackford, postage, etc	1 12	
H. G. Cornell, stenography for E. G. Blackford	3 60	
Mrs. J. H. Lockwood, sundries	1 60	
James B. Simonson, stove pipe	1 85	
S. A. Walters, top for flagstaff	3 00	
Fred Mather, travel and sundries	7 77	
Fee of notary public	12	
		108 83
		$257 61

ABSTRACT FOR MARCH, 1888.

Superintendence.

Fred Mather, one months salary		$125 00

Labor of employés.

Peter Gorman, 24 days labor at $1.50		36 00

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Traveling expenses.

Peter Gorman, distributing white fish	$6 90	
Peter Gorman, distributing white fish	5 90	
		$12 80

Express charges and freight.

Adams express, fish eggs to New York	$4 25	
Long Island express, fish eggs from New York	50	
Long Island express, fish eggs from Michigan	6 00	
Long Island express, live smelts	50	
Long Island express, fish eggs	80	
Long Island express, fish eggs	60	
Long Island express, fish eggs	1 25	
Long Island express, fish eggs	60	
Long Island express, fish eggs	35	
Long Island express, live smelts	1 00	
Adams express, fish eggs to New York	1 75	
Long Island express, fish eggs from New York	65	
Erie express, fish eggs to New York	1 80	
Long Island express, fish eggs from New York	50	
		20 55

Fish food.

Louis Bennett, 20 bushels mussels at 15 cents		3 00

Miscellaneous.

E. G. Blackford, telegrams and cartage	$4 25	
Peter Gorman, 50 live smelts and expenses	10 25	
Peter Gorman, 75 live smelts and expenses	13 90	
H. C. Squires, ammunition	5 15	
Postage stamps for report, etc	5 00	
Fee of notary public	25	
E. G. Blackford, postage and cartage	2 00	
		40 80
Total		$238 15

ABSTRACT FOR APRIL 1888.

Superintendence.

Fred Mather, superintendent, one months salary	$125 00

Labor of employés.

Robert H. King, 12 days labor at 50 cents	$6 00
Elwood A. Cooper, 13 days labor at 50 cents	6 50
William Holmes, 18½ days labor at $1.50	27 74

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Peter Gorman, 25 days labor at $1.50	$37 50	
A. W. Halsey, 6 days labor at $1.50	9 00	
J. McMenoman, 6 days labor at $1.50	9 00	
		$95 74
Express charges and freight.		
Long Island express, envelopes and paper	$0 50	
Long Island express, letter-heads	25	
		75
Miscellaneous.		
McEwan & Co., lumber for various uses	$80 76	
Wood & Carll, lime and cement	12 35	
Wood & Carll, drain tile	60 10	
Wood & Carll, coal	15 00	
Telegrams to E. B. Hodge and E. G. Blackford	54	
John M. Davis, printing in 1887 and 1888	17 75	
E. G. Blackford, telegrams and postage	2 90	
Telegram to S. A. Forbes	25	
John C. Totten, horse hire for commissioners	10 00	
E. Abrams, 1 barrel of pitch	1 60	
Howard & Down, blacksmithing	2 50	
Isaac Adams two tin pails	1 00	
Postage stamps	3 00	
Fee of notary public	25	
		208 00
Total		$429 49

ABSTRACT FOR MAY, 1888.

Superintendence.		
Fred Mather, one months salary		$125 00
Labor of employés.		
Elwood A. Cooper, 27 days labor at 50 cents	$13 50	
Wm. Holmes, 20 days labor at $1.50	30 00	
		43 50
Express charges and freight.		
Long Island express, five boxes shad eggs		1 50
Fish food.		
Louis Bennett, 59 bushels mussels at 15 cents		8 85
Miscellaneous.		
E. G. Blackford, cartage on shad eggs	$1 50	
Telegram from E. G. Blackford	25	

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Mrs. J. H. Lockwood, sundries	$19 43	
E. C. Auld, stenography for Commissioner Blackford,	8 25	
E. G. Blackford, 9 ten-gallon cans, at $2.00	18 00	
E. G. Blackford, postage stamps	50	
Telegram from E. G. Blackford	25	
Postage stamps	2 00	
Notary public	12	
		$50 30
Total		$229 15

ABSTRACT FOR JUNE, 1888.

Superintendence.

Fred Mather, superintendent, one months salary	$125 00

Labor of employés.

Peter Gorman, 18½ days labor at $1.50	$36 75	
William Holmes, 18 days labor at $1.50	36 00	
O. V. Rogers, 30 days labor at $1.75	52 50	
C. H. Walters, 30 days labor at $2	60 00	
E. A. Cooper, 26 days labor at 50 cents	13 00	
		198 25

Express charges and freight.

Long Island express, window shades from New York,	$0 50	
Long Island express, three empty cans	1 25	
Long Island express, tools from New York	25	
Long Island express, lawn mower	40	
Long Island express, wire cloth	25	
Long Island express, frames and level	50	
		3 15

Fish food.

Louis Bennett, 4 bushels of soft clams at $1.50	$6 00	
Louis Bennett, 32 bushels of mussels at 15 cents	4 80	
		10 80

Miscellaneous.

J. N. Collins & Co., window shades	$16 05
Charles E. Little, tools	10 36
Page, Dennis & Co., lawn mower	7 50
M. Magee, flag	8 00
John Swan & Co., netting frames and level	6 36
Howard & Morse, wire cloth	2 16

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Postage stamps	$1 20	
Four dozen brass screw rings	80	
Notary Public	12	
		$52 55
Total		$389 75

ABSTRACT FOR JULY, 1888.

Superintendence.

Fred Mather, superintendent, one months salary		$125 00

Labor of employés.

C. H. Walters, 31 days labor at $2.00	$62 00	
O. V. Rogers, 29 days labor at $1.75	50 75	
Peter Gorman, 22½ days labor at $1.50	33 75	
William Holmes, 22½ days labor at $1.50	33 75	
E. A. Cooper, 26 days labor at 50c	13 00	
James Wheeler, 17 days labor, with horse and cart, at $2.50	44 37	
		237 62

Express charges and freight.

Long Island express, stationery	$0 25	
Long Island express, tools	25	
Long Island express, plumbers supplies	75	
Long Island railroad, freight and cartage	1 45	
		2 70

Fish food.

Louis Bennett, sixty bushels of mussels at 15c		9 00

Miscellaneous.

E. C. Auld, stenography and type-writing for E. G. Blackford	$6 02	
Wood and coal, ash plank	6 53	
John M. Davis, printing	5 00	
Charles E. Little, tools	2 77	
William Doty, lettering on building and chimney	9 00	
Fred Adee & Co., lead pipe, etc	17 57	
Mrs. J. H. Lockwood, sundries	20 36	
J. J. Lavell, blacksmithing	6 10	
Fred Adee & Co., plumber's supplies	19 10	

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E. G. Blackford, postage and telegrams	$2 07	
F. Mather, sundries	1 33	
Postage stamps	1 00	
Notary public	12	
		$96 97
Total		$471 29

ABSTRACT FOR AUGUST, 1888.

Superintendence.

Fred Mather, superintendent, one months salary		$125 00

Labor of employés.

C. H. Walters, 31 days labor at $2.00	$62 00	
O. V. Rogers, 27 days labor at $1.75	47 25	
Peter Gorman, 25 days labor at $1.50	37 50	
Wm. Holmes, 18¾ days labor at $1.50	27 13	
E. A. Cooper, 27 days labor at 50 cents	13 50	
James Wheeler, 25½ days labor with horse and cart, at $2.50	63 75	
		252 13

Express charges and freight.

Long Island express, pitcher plants from James H. Marks	$1 90	
Long Island express, collimator from Rochester	60	
		2 50

Fish food.

Louis Bennet, 60 bushels mussels at 15 cents		9 00

Miscellaneous.

W. H. Stoyle, three spawning funnels	$3 00	
C. H. Lockwood, one collimator	2 00	
Fred Adee & Co., plumbers' supplies	2 10	
Postage stamps	2 00	
Pocket thermometer	1 00	
Notary public	12	
		10 22
Total		$398 85

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ABSTRACT FOR SEPTEMBER, 1888.

Superintendence.

Fred Mather, superintendent, one months pay		$125 00

Labor of employés.

C. H. Walters, 30 days labor at $2.00	$60 00	
O. V. Rogers, 25 days labor at $1.75	43 75	
Peter Gorman, 25 days labor at $1.50	37 50	
William Holmes, 12¾ days labor at $1.50	19 12	
George A. Mason, 10½ days labor at $1.50	15 75	
William Warren, 6½ days carpenter work on cupola at $2.50	16 25	
E. A. Cooper, 25 days labor at 50 cents	12 50	
James Wheeler, 22¾ days labor with horse and cart at $2.50	56 87	
		261 74

Express charges and freight.

Long Island express, money for paying men	$0 35	
Long Island express, tools from New York	25	
Long Island express, cotton waste for engine	25	
		85

Fish food.

Louis Bennett, 56 bushels mussels at 15 cents		8 40

Traveling expenses.

Fred Mather, to Long Island City to order lumber		2 95

Miscellaneous.

C. H. Delamater & Co., labor and material	$70 34	
McEwan & Co., lumber for cupola	35 50	
C. H. Delamater & Co., 10 pounds cotton waste	1 25	
Postage stamps	2 00	
Notary public	12	
		109 21
		$508 15

ABSTRACT FOR OCTOBER, 1888.

Superintendence.

Fred Mather, superintendent, one months salary		$125 00

Labor of employés.

Peter Gorman, 26 days labor at $1.50	$39 00	
George A. Mason, 23½ days labor at $1.50	35 25	

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Wm. Holmes, 22½ days labor at $1.50	$33 75	
C. M. Raymond, 19 days labor at $1.25	23 75	
E. A. Cooper, 31 days labor at 75 cents	23 25	
W. H Warren, 17 days carpenter work at $2.50	42 50	
James Wheeler, 23½ days labor with two horses and carts at $5.00	117 50	
		$315 00

Express charges and freight.

Long Island express, hardware and tools	$0 40	
Long Island express, paint for troughs	40	
Long Island express, stationery	25	
Long Island express, sundries	25	
Long Island express, envelopes	25	
		1 55

Fish food.

Louis Bennett, 62 bushels of mussels at 15 cents		9 30

Miscellaneous.

E. G. Blackford, sundries	$9 87	
Charles E. Little, tools	6 99	
Standard Paint Company, paint for troughs	6 00	
Wilbur & Hastings, office necessaries	10 15	
F. H. Lockwood, six photographs of new hatchery	6 00	
John M. Davis, envelopes	2 50	
Postage on ninety reports, at five cents	4 50	
Postage on correspondence	1 50	
Notary public	12	
		47 63
Total		$498 48

ABSTRACT FOR NOVEMBER, 1888.

Superintendence.

Fred Mather, one months salary		$125 00

Labor of employés.

C. H. Walters, 30 days labor at $2.00	$60 00	
O. V. Rogers, 26 days labor at $1.75	45 50	
Peter Gorman, 19 days labor at $1.50	28 50	
Geo. A. Mason, 19 days labor at $1.50	28 50	
Wm. Holmes, 13 days labor at $1.50	19 50	
E. A. Cooper, 29 days labor at $1.75	21 75	

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Wm. H. Warren, 2 days carpenter work at $2.50	$5 00	
James Wheeler, 19 days labor with horses and cart, at $5.00	95 00	
		$303 75
Express charges and freight.		
Long Island express, hardware	$0 50	
Long Island railroad, freight on plank	10 00	
John C. Totten, cartage on plank	17 00	
Long Island express, gate fixtures	25	
Long Island express, brass gates	25	
		28 00
Fish food.		
Louis Bennett, 60 bushels of mussels at 15 cents		9 00
Traveling expenses.		
C. H. Walters, to Long Island City to select lumber		2 70
Miscellaneous.		
Wood & Carll, drain tile	$20 70	
Wood & Carll, lumber	5 65	
Wood & Carll, cement	17 50	
Continental Insurance Company	50 00	
Chas. E. Little, hardware	10 29	
E. W. McClave, yellow-pine plank for ponds	221 97	
Chas. Ost, sawing 81 locust posts, at five cents	4 05	
Wood & Carll, lumber for repairs	5 91	
Postage stamps	50	
Notary public	24	
		336 81
Total		$805 26

CLASSIFICATION.

MONTHS.	Salary of superintendent.	Labor of employés.	Express and freight charges.	Traveling expenses.	Fish food.	Miscellaneous.	Total.
December	$125 00	$106 50	$53 25	.....	$0 90	$255 70	$541 35
January	125 00	37 50	8 40	$3 15	75	108 09	282 89
February	125 00	20 42	1 86	.....	1 50	108 83	257 61
March	125 00	36 00	20 55	12 80	3 00	40 80	238 15
April	125 00	95 74	75	.....	.....	208 00	429 49
May	125 00	43 50	1 50	.....	8 85	50 30	229 15
June	125 00	198 25	3 15	.....	10 80	52 85	389 75
July	125 00	237 62	2 70	.....	9 00	96 97	471 29
August	125 00	252 13	2 50	.....	9 00	10 22	398 85
September	125 00	261 74	85	2 95	8 40	109 21	508 15
October	125 00	315 00	1 55	.....	9 30	47 63	498 48
November	125 00	303 75	28 00	2 70	9 00	336 81	805 26
Total	$1,500 00	$1,908 15	$125 06	$21 60	$70 50	$1,425 11	$5,050 42

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ADIRONDACK.

ABSTRACT FOR DECEMBER, 1887.

James H. Marks, one months salary as superintendent, $75.00; express, $6.50; postage stamps, $1.50	$82 81

Labor of employés.

Edwin Otis, 31 days work at $1.25 per day	38 75
Joseph Otis, 31 days work at $1.25 per day	38 75
Millard F. Otis, 27 days work at $1.50 per day	40 50
John G. Roberts, 31 days work at $1.50 per day	46 50
Mrs. James H. Marks, one months housekeeping at $4.0 0	4 00
N. B. Flanders, blacksmithing	2 65
Titus & Town, one account book, $1.13; thermometer, $1.10; 5 pounds crackers, at 10 cents, 50 cents	2 73
R. H. McIntyre, hardware	5 15
J. H. Ferngton, groceries and provisions	19 24
Mrs. Edwin Otis, milk	4 80
M. L. Baldwin, hotel bill	2 75
New Hartford Canning Company, canned goods	59 72
Total	$348 35

ABSTRACT FOR JANUARY, 1888.

James H. Mark, salary as superintendent	$75 00
Adirondack Express Company, barrel kerosene oil, $2.20; one keg pickles from Utica, 68 cents	2 88
Adirondack Express Company, one box fish eggs from Caledonia	3 25
National Express Company, box fish eggs from Caledonia	1 75
Hotel bill, Paul Smith's station	2 50

Labor of employés.

Edwin Otis, 31 days work at $1.25 per day	38 75
John G. Roberts, 31 days work at $1.50 per day	46 50
Millard F. Otis, 31 days work at $1.50 per day	46 50
Joseph Otis, 31 days work at $1.25 per day	38 75
Mrs. James H. Marks, housekeeping, at $4 per month	4 00
M. L. Baldwin, hotel bill	2 75
Felix Gonyea, filing three saws,	3 50
George Fowler, board of men gathering spawn	32 50

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Peter Corley, beef	$8 00
J. H. Ferrington, groceries and provisions	28 45
Chesley & Bornard, groceries and provisions	9 73
Total	$344 81

ABSTRACT FOR FEBRUARY.

James H. Marks, salary as superintendent	$75 00
Postage stamps	1 00
J. H. Ferington, groceries, $14.98; hardware, $4.68	19 66
Chesley & Barnard, groceries	27 70
M. L. Baldwin, hotel bill	2 50
R. H. McIntyre, hardware	62 23
Titus & Town, one account book, 75 cents; book-writing pads, 50 cents; groceries, $6.05	7 30
Edwin Otis, 29 days work at $1.25 per day	36 25
John G. Roberts, 29 days work at $1.50 per day	43 50
Joseph Otis, 29 days work at $1.25 per day	36 25
Mrs. James H. Marks, housekeeping one month	4 00
Willard F. Otis, 29 days work at $1.50 per day	43 50
Mrs. Edwin Otis, milk	3 48
Total	$362 37

ABSTRACT FOR MARCH, 1888.

James H. Marks, salary as superintendent	$75 00
J. H. Ferington, groceries, $18.37; paints and oils, $3.84	22 21
William Mullen, beef	15 92
M. L. Baldwin, hotel bill	3 75
John G. Roberts, 31 days works at $1.50 per day	46 50
Edwin Otis, 31 days work at $1.25 per day	38 75
Joseph Otis, 31 days work at $1.25 per day	38 75
Millard F. Otis, 31 days work at $1.50 per day, $46.50; 1 cutter, $25	71 50
Chesley & Barnard, groceries and provisions	7 14
Titus & Town, housekeeping supplies, etc	1 48
Mrs. James H. Marks, housekeeping one month	4 00
Rufus Wokes, hay, $12; turnips, $1.50	13 50
Total	$338 50

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ABSTRACT FOR APRIL, 1888.

James H. Marks, one months salary as superintendent, $75; hotel bill, 75 cents; postage, $1.30; express, 95 cents, on wall-paper from Malone	$78 00
John G. Roberts, 30 days work at $1.50 per day	45 00
Joseph Otis, 30 days work at $1.25 per day, $37.50; buggy shaft, $1	38 50
Edwin Otis, 30 days work at $1.25 per day	37 50
Millard F. Otis, 30 days work at $1.50 per day	45 00
Mrs. J. H. Marks, one months housekeeping	4 00
Titus & Town, paints, oils and miscellaneous, etc	11 65
Chesley & Barnard, housekeeping supplies	19 18
M. L. Baldwin, hotel bill	2 00
H. A. Putnam, wall paper	6 01
William Mullen, fresh beef	17 91
Mrs. C. L. Bartlett, board of men gathering spawn	30 00
J. H. Ferington, groceries, $48.93; one cow, $40	88 93
Mrs. Edwin Otis, milk bill	2 82
Joseph Boks, lumber for flat boats	12 79
N. B. Flanders, blacksmithing	2 90
Total	$442 19

ABSTRACT FOR MAY, 1888.

James H. Marks, one months salary as superintendent	$75 00
Postage, $1.10; paid man repairing fire-place, $1.50; hotel bill in Saranac, 75 cents	78 35
John G. Roberts, 31 days work at $1.50 per day	46 50
Millard F. Otis, 31 days work at $1.50 per day	46 50
Mrs. J. H. Marks, one month housekeeping	4 00
R. H. McIntyre, hardware	37 72
Chesley & Barnard, housekeeping supplies	6 85
Herbert Miller, lettering hatchery $5.00; two days labor at $1.25, $2.50	7 50
Burdick Furniture Company, lumber $6.13; miscellaneous material $9.13	15 61
J. H. Ferington, housekeeping supplies	35 49
Total	$278 52

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ABSTRACT FOR JUNE, 1888.

James H. Marks, one month salary as superintendent, $75.00; hotel bill, 50 cents; postage stamps	$76 00
Millard F. Otis, 30 days work at $1.50 per day	45 00
John G. Roberts, 30 days work at $1.50 per day	45 00
Mrs. J. H. Marks, one months housekeeping at $4.00	4 00
R. H. McIntyre, hardware	4 79
Titus & Town, housekeeping supplies	1 40
Chesley & Barnard, housekeeping supplies	4 50
Felix Gonyea, filing saws	1 00
M. L. Baldwin, hotel bill	5 75
Milo B. Miller, groceries	8 33
William Mullen, beef	3 78
J. H. Ferington, housekeeping supplies	44 66
One man, two days work, at $1.00 per day	2 00
Drawing freight	1 50
Three and one-half days work, man and team plowing, $2.50 per day	8 75
One-half double harness	20 00
Joseph Carl, to 3 days work on grounds	4 50
Total	$281 06

ABSTRACT FOR JULY, 1888.

James H. Marks, one months salary as superintendent	$75 00
Postage stamps	1 00
Millard F. Otis, 31 days work at $1.50	46 50
John G. Roberts, 31 days work at $1.50	46 50
Herbert Otis, 7 days work at $1.25	8 75
Mrs. J. H. Marks, 1 months housekeeping	4 00
R. H. McIntyre, hardware	3 50
Joseph Caslan, 1 pig	2 50
Chesley & Barnard, housekeeping supplies	14 83
D. W. Riddle, housekeeping supplies	3 00
N. B. Flanders, blacksmithing	4 05
Burdick Furniture Company	1 43
One-half hours machine work	75
For lettering four sign boards	6 00
E. G. Ricketson, oars and oar locks	6 20

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Putnam & Whiting, beef	$22 83
J. H. Ferington, housekeeping supplies	40 89
One horse net, $1; 1 single harness, $25	26 00
	$313 73

ABSTRACT FOR AUGUST, 1888.

James H. Mark, one month salary as superintendent, $75; two lbs. cotton twine, at 34 cents, 68 cents; two balls gilling thread, at 60 cents, $1.20; postage, $1.00	$77 58
Mrs. I. H. Marks, one month housekeping	4 00
Willard F. Otis, 31 days work at $1.50 per day	46 50
One hundred fence posts at 5 cents per post	5 00
John O'Connell, 31 days work at $1.00 per day	31 00
John G. Roberts, 31 days work at $1.50 per day	46 50
R. H. McIntyre, hardware	19 57
Titus and Tower, housekeeping supplies, $3.42; 5 gallons turpentine, at 75 cents, $3.75; stationery, $6.75	13 92
Chesley & Bernard, housekeeping supplies	15 51
M. L. Baldwin, hotel bill	8 75
J. H. Ferington, housekeeping supplies	37 70
Rufus Wokes, 2 tons hay, at $16.00 per ton	32 00
D. W. Riddle, housekeeping supplies, 60 cents; lumber, $20.65	21 25
Total	$359 58

ABSTRACT FOR SEPTEMBER, 1888.

James H. Marks, one months salary as superintendent, $75.00; housekeeping supplies, $2.15; setting 1 horse shoe, 25 cents,	$77 40
Millard F. Otis, 30 days work at $1.50 per day	45 00
James G. Roberts, 30 days work at $1.50 per day	45 00
Edwin Otis, 6 days work at $1.50 per day	9 00
Joseph Otis, 6 days work at $1.50 per day	9 00
John O'Connell, 30 days work at $1.00 per day	30 00
Mr. T. H. Marks, one month housekeeping, $4.00; knitting gill-net, one pound, $1.50	5 50
Felix Gonyea, mending carriage	3 25
N. B. Flanders, blacksmithing	6 93
Birdick Furniture Company, one mattress, $5.00; one spring bed, $5.00	10 00
Charles S. Taylor, drawing map of hatchery reservoir	8 00
M. L. Baldwin, hotel bill	7 75
L. C. Childs, stationery bill heads	2 50

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D. M. Riddle, lumber, $6.50; hardware, $1.10; boat rent, 50 cents; one wall tent, $15.00; housekeeping supplies, $2.24	$25 34
Putnam & Whitney, housekeeping supplies	44 84
J. H. Ferington, housekeeping supplies, $52.16; hardware, 50 cents	52 66
R. H. McIntyre, hardware	11 53
William Mullen, beef	3 99
Titus & Town, housekeeping supplies	7 16
Total	$404 85

ABSTRACT FOR OCTOBER, 1888.

James H. Marks, one months salary as superintendent, $75.00; freight on canned goods, $8,49; hotel bill, $9.00; postage stamps, $1.00	$93 49
Edwin Otis, 31 days work at $1.50 per day	46 50
Joseph Otis, 31 days work at $1.50 per day	46 50
John G. Roberts, 31 days work at $1.50 per day	46 50
William F. Otis, 31 days work at $1.50 per day	46 50
John O.'Connell, 31 days work at $1.00 per day	31 00
D. W. Riddle, housekeeping supplies	3 57
Chesley & Barnard, groceries, $5.60; lap-robe, $3.25	8 85
G. G. Whitman, hauling freight, $3,00	3 00
Wallace Murrary, hotel bill, $3.25	3 25
J. H. Ferrington, housekeeping supplies, $42.13; drawing freight, $1.50	43 63
Putnam & Whitney, housekeeping supplies, $17.94	17 94
Total	$390 73

ABSTRACT FOR NOVEMBER, 1888.

James H. Marks, one month salary as superintendent	$75 00
Expense of spawn gathering at Chateaugay lake	18 10
Adirondack Express Company, on fish eggs from Detroit	34 50
Postage stamps	2 00
Edwin Otis, 30 days work at $1.50 per day	45 00
Millard F. Otis, 30 days work at $1.50 per day	45 00
Joseph Otis, 30 days work at $1.50 per day	45 00
Mrs. J. H. Marks, one month housekeeping	6 00
John O'Connell, 30 days work, at $1 per day, $30; one bushel beans, $2	32 00
John G. Roberts, 30 days work, at $1.50 per day	45 00
Henry Swinger, team work, $12; three bushels turnips, $1.20	13 20

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R. H. McIntyre, hardware	$3 25
Putnam & Whitney, housekeeping supplies	15 54
J. H. Ferington, housekeeping supplies	33 63
W. C. Settle, hotel bill, $7.85; one gallon oysters, $1.75	9 60
John G. Roberts (expenses), spawn gathering from the western lakes	176 97
Total	$599 79

CLASSIFICATION.

MONTHS.	Salary of superintendent.	Labor.	Subsistence.	Transportation, travel and team hire.	Building material and building.	Furniture.	Hatchery equipment.	Expenses of spawn gathering.	Miscellaneous and contingent.	Total.
1887.										
December	$75 00	$171 15	$84 26	$9 25	.....	.....	$2 23	.....	$6 65	$348 54
1888.										
January	75 00	174 50	56 18	13 13	.....	.....	.....	$32 50	3 50	354 81
February	75 00	163 50	56 89	2 50	.....	.....	.....	.....	64 48	362 71
March	75 00	174 50	60 25	3 75	.....	.....	25 00	.....	.....	238 50
April	75 00	169 00	69 66	4 70	$6 01	.....	71 97	30 00	15 85	442 19
May	75 00	99 50	35 49	75	15 61	.....	6 85	.....	45 22	278 42
June	75 00	109 25	62 44	6 75	.....	.....	20 00	.....	6 29	272 98
July	75 00	105 75	81 55	.....	.....	.....	36 13	.....	14 30	276 73
August	75 00	128 00	109 88	8 75	.....	.....	27 50	.....	32 88	359 51
September	75 00	.....	.....	.....	.....	$10 00	27 50	.....	33 11	467 90
October	75 00	217 00	72 34	22 23	.....	.....	3 25	.....	1 00	390 82
November	75 00	230 00	52 12	42 35	.....	.....	.....	195 07	5 25	600 09

MISCELLANEOUS.

DEPARTMENT OF GAME AND FISH PROTECTION.

Expenses in the department of the Commissioners of Fisheries, for their necessary and incidental expenses in executing their duties, under chapter 317, *Laws of* 1873. (*Appropriation, page* 681, *chapter* 491, *Laws of* 1883):

Amount of appropriation remaining unexpended as per last report $173 38

Date.	Number of voucher.	TO WHOM PAID.	For what purpose.	Amount.
.....	41	H. H. Thomspon	.....	$8 63
.....	42	C. M. Parke	Legal services	85 00
.....	43	Cookenham & Sherman	Legal services and costs	85 00
.....	44	L. C. Childs & Son	Printing and stationery	4 75
				$173 38

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3 2044 072 182 108

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